The Builder.

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An Account of the Tunnel through Mont Cenis.

WE are glad to be able to place before our readers an account of a work of the highest interest in its present stage, and fraught with advantages in the future. We give it in the words of our correspondent, Mr. W. H. Villiers Sankey:—

A few days ago I directed my way to the station of the railway that leads to Susa, not for the purpose of going *over* the Alps, but with the intention of penetrating *under* them, into the hitherto hidden mysteries of their interior.

Most people in the present day have heard of the great Tunnel which is being made with the object of affording railway communication, complete and uninterrupted, between France and Italy; but very few, indeed, have anything more than an idea, vague and indistinct, that such a project has been in contemplation for some time. I was determined to judge for myself, and to convey to others the information necessary to form a correct judgment on the matter, so that the world might be made acquainted with the true state of the case.

Turin has lately become a place of so much interest that an immense concourse of people now visit it every year, and hardly a day passes but great numbers travel over the railway which connects that city with the small but prettily situate town of Susa, which lies at the foot of the Mont-Cenis pass. Most of them, however, go by the express train by night, and know nothing of the beauties of the lake of Avegliano, or the grand sight which may be had from the Monastery of St. Michele, just above the village of St. Ambrozio: a panoramic view of extreme loveliness, showing the meandering windings of the Dora Riparia river, spread along the bed of the valley like a ribbon of silver far, far below — fantastically wreathing around and connecting together the various picturesque towns and villages spread out, as it were, upon a velvet plain.

From Susa to Bardonèche the country presents scenes of ever-changing beauty,—now rich and cultivated, now wild and sterile,—here English-looking lanes, with hawthorn and lilac, grassy lawns and pretty undulating hills,—there headlong cascades and perennial glaciers, wild moors, perpendicular rocks, and the towering Alps capped with never-melting snow.

At Bardonèche, where the hitherto narrow valley spreads out into a kind of amphitheatre, cultivation seems again to resume its reign; not luxuriant, nor rich, but green, grassy, and genial. The mountains are not steep, but are rather spread out at their bases, and look like great pyramids; they, together with the plain, are divided into patches of different shades of verdure of every conceivable shape. These consist of grass-land, corn, and green crops, and every kind of cultivation in various stages of advancement; some of the plants are only just making their appearance, while others are well on their way towards maturity. I left Susa at about three o'clock in the morning, and arrived at Bardonèche about noon, and found the whole population had turned out into the fields to take advantage of a shower of fertilizing, fine rain; every one was busily engaged in sowing or ploughing. The scene was very singular,—the male portion of the population were guiding small ploughs drawn by picturesque-looking mules in neat harness of very peculiar form; men followed, filling in the newly-made furrows with seed; and women and children brought up the rear, armed with curious-looking hoes, with which they were drawing the earth over the precious deposit.

On the road, which is well kept and good, though extremely narrow, were several groups returning to breakfast, as they had probably been working since the early dawn of day; they carried each the implements they had been using, and many of the men were shouldering the light ploughs, which they had been previously guiding, with a careless, *nonchalant* air. The whole scene had a primitive appearance about it which contrasted curiously with the great town-looking houses, in which the government engineers and many of the work-people engaged in the tunnel have their residences; and the reservoirs, immense water-pipes, and great *ateliers* by means of which the gigantic highway of the very latest civilization is making a rapid progress beneath the loftiest mountains of Europe.

Provided with a letter from the Government engineer, I was afforded every opportunity of getting a complete idea of the whole undertaking, and can now perform the part of cicerone to the reading public at home, whom I am about to conduct over this wonderful *chantier*, in which the charms of nature are combined with the genius of art. The first idea of making a tunnel in the direction now fixed upon for the railway between Piedmont and France was suggested by a person named Medail, an inhabitant of Bardonèche, who, being well acquainted with the country, and knowing the footpath traversed by the mountain populations in their constant communication with the inhabitants of the valley of the Arc, was the first to announce that the pass by the *Col de Frejus* was the least difficult of all roads leading to Savoy.

Acting on this information, the Sardinian Government directed Mr. Mans, the celebrated Belgian engineer, and the Chev. Sismondi, a very eminent geologist, to undertake an examination of that part of the country which lies between Susa and Modana. By their studies they confirmed the opinion of Medail; so they proceeded to draw up plans of operations for the purpose of effecting a railway intercommunication between Piedmont and Savoy.

According to those studies it became evident that the line of railway would have to pass under the Frejus ridge at a depth *of a full English mile below the surface*, and that the length of the tunnel would be somewhere above eight English miles. Shafts were therefore quite out of the question, and it was determined that the tunnel should be worked from its extremities alone: that is to say, that four miles of it or more should be worked from the Piedmontese end, and a like length worked from the end commencing in Savoy.

These conditions, which are imposed by the nature of the work itself, involved two great difficulties: *one, the immense time which it would take to excavate so long a tunnel from only two faces; and the other, the apparent impossibility of ventilating it during the progress of the work.* In order to obviate these difficulties, various plans were suggested. Mr. Colladon, Mr. Bartlett, and others, proposed means which contributed to the invention of the system now adopted.

Taking advantage of these preliminary propositions, Messrs. Grattoni, Sommellier, and Grandis set themselves together to work, in the hopes of being able to solve the problem; and their labours have been so successful that the Government here (after having received the report of a commission of illustrious Sardinian *savans*, who had been appointed to verify the plans proposed by those gentlemen, and to make experiments, for the purpose of testing the value of the method which they had proposed to adopt) empowered them to construct the proposed tunnel in the manner they had suggested.

The arrangement made by Messrs. Grattoni, Sommellier, & Grandis provides for both the difficulties, by one and the same apparatus, which forces the air (driven by intermittent strokes) into large reservoirs, from which it flows uniformly through a tube laid from the *atelier*, where the reservoirs are placed into the interior of the heading. This air, which is forced in by taking advantage of the weight and fall of water, is first used to work the tools for drilling holes in the face of the rock, after which it is allowed to escape into the tunnel; and thus the air is constantly changed, and good ventilation efficiently provided for.

As this hydropneumatic machinery is the principal agent used in the carrying out of the work, it is necessary that our readers should have an idea of the manner in which it acts; and, indeed, it is the first thing that presents itself to the eye after passing the dwelling-houses of the managers and other persons engaged in the various operations.

Well, some thirty or forty yards above the general level of the plain there is a small reservoir, or cistern, of water, filled by a canal that is fed by a supply from a mountain torrent at some great distance away. From the reservoir there are ten principal iron cylinders laid on beds of masonry against the steep slope of the mountain: each of these can be made to receive the water from the reservoir by opening sluices or valves up above: in this case the water rushes down the iron cylinder into the *atelier* where the iron reservoirs for storing the air are placed, one corresponding to each tube that is laid against the side of the mountain.

The way in which the air is forced into the iron reservoirs is as follows:—

Each tube that comes down the side of the mountain, and which is about two feet in diameter, is continued on horizontally some ten or twelve feet below the floor of the *atelier*, after which it is bent and rises up perpendicularly, or, rather, the main tube communicates underneath with a hollow vertical column from 12 feet to 16 feet high, in the top of which there is a valve opening downwards: there is also another valve to separate the sloping part of the tube from the horizontal portion. The whole of the tube, including the sloping part between the water reservoir on the side of the mountain and the floor of the *atelier*, the horizontal part beneath the floor, and the vertical part which rises up in the *atelier* some 12 or 16 feet,—forms altogether a syphon, in which not only the weight of the water acts, but also the momentum of the water descending all the way from the lofty mountain ridge whence it originally proceeds. We may suppose the whole of this syphon filled by water, to begin with. The first operation, then, in working, is to close the valve at the foot of the sloping part, and afterwards to discharge the water in the horizontal and vertical portions of the tube: this being done, the valve at the top of the vertical column falls down and admits the air. The valve at the foot of the sloping tube is then reopened, and the one at the top of the vertical column closed; the water thus rushes in and compresses the air in the shorter end of the syphon to six atmospheres; this water after that is discharged as before, and fresh air admitted; but it should be understood that when the air is compressed in the upper portion of the vertical cylinder it passes away at once by small tubes into the iron reservoir (which is of the shape of a pontoon). Each contains nearly 5,600 cubic feet of air, is about 33 feet long, and nearly 6 feet in diameter. All these operations are effected in much less time than it takes to describe them; and the opening and shutting of the valves of *alimentation* and *discharge* are

effected opportunely, without the intervention of human aid, thanks to the automatic action of a small apparatus, regulated suitably by a column of water.

The air in passing from the upright column into the reservoir loses some of its density, and has only a pressure of 4½ atmospheres. The bottoms of the reservoirs are filled with water, which is displaced as the compressed air enters; this is supplied by two smaller tubes, which descend the side of the mountain between the larger ones, that is, they have five large water tubes on either side of them. These reservoirs are furnished with water-gauges, by which the quantity of air and water in them may be seen and regulated at any time by the mechanical engineer in charge of the works.

The cylinders being always kept sufficiently full according to the judgment of the engineer, the apparatus is constantly in working order; and the operations of boring the holes for blasting in the heading, and a constant supply of fresh air in the tunnel, are a natural consequence. But before proceeding to describe the operations of the boring-machines, and how they are put in motion, I may mention that 7,924 strokes of the machinery per day produce about 51,000 cubic feet of compressed air, which flows away into the cylinders of the boring-machines, and eventually into the tunnel, which it ventilates admirably.

After having examined the details of the primary mechanism, I proceeded to visit the Tunnel, which enters the mountain by a temporary ingress at about half a mile from the *atelier* which contains the air-reservoirs: and here I must own I was immensely gratified and surprised on beholding a magnificent gallery of great length, breadth, and height, extending in a beautiful straight line far into the earth—a dry, lofty, and spacious roadway making its way beneath the regions of everlasting snow. I had no idea that the mighty undertaking had been carried out on so grand a scale, or that it had been so completely successful. I felt proud of the intellect and industry of my fellow-man,—not in subduing nature and triumphing over it by art, as is often said unreflectingly by educated persons who ought to know better, but for making use of the elements which God had placed at his disposal, to aid in carrying out so legitimate and useful an undertaking.

The machinery employed for boring is a combination of two systems,—the one proposed by Professor Colladon, of Geneva; and the other by Mr. Bartlett, who was at that time superintending the contract works on the Victor Emmanuel Railway.

Professor Colladon took out a patent, in 1855, for a means of driving compressed air far into a tunnel, with the object of making it available for boring holes in the rock, and afterwards of using the air, as it escapes and expands, for the purpose of ventilating the tunnel.

Mr. Bartlett took out a patent, in the same year, for an apparatus, to be worked by steam, to bore holes in the rock by machinery; and the system proposed by him, although constantly being modified and improved upon as the work goes on, is the basis of the working appliances now in use boring the holes for blasting the rock in the heading.

Messrs. Sommellier, Grattoni, & Grandis have combined these two systems, and have carried them out practically on a grand scale.

The principle of the machinery for boring is extremely simple. The machinery consists of two essential parts,—one the apparatus for driving the cutting tool into the rock and withdrawing it, so that the blow may be repeated while at the same time it is made to take a whole turn on its axis, now towards the right, and now towards the left; and the other, the machinery for advancing the bed on which the cutting tool rests as the work goes on, so that the auger or borer may constantly advance as the hole is being bored, and may be kept well up to the surface it has to operate upon. Both portions of this machine are worked by means of the compressed air.

The first or cutting part of the machine is a long borer, which in reality is fixed upon a continuation of the piston-rod, working in a cylinder into which the compressed air is admitted fore and aft alternately, so as to drive the piston forward against the rock, and withdraw it by a back and forward motion, while a turning motion is given at the same time. The edge of the borer is in the shape of the letter Z, so that, in turning and returning, the substance of the rock is ground away in the hole, as well as pulverized by impact.

Six of these borers, with the machinery for driving them forwards; six reservoirs containing water, which is forced in a constant jet into the hole while the boring is being performed, so as to facilitate operations and clear away the *débris*; apparatus for lighting by gas, are mounted on a railway-carriage frame, and the whole works in a heading, 11 feet 6 inches by 11 feet. It drives holes in the rock varying from 2 to 3 feet in about twenty minutes. These holes can be bored either horizontally, vertically, or obliquely; as many as eighty are sometimes driven in the face; but they are not all charged with powder, the object in making most of them being merely to facilitate the breaking up of the rock when the powder explodes in the others.

When the holes are bored the machine is drawn back upon the rails to a distance of about 50 yards; great wooden doors are then shut to prevent the blasting from doing an injury to the machinery; and the holes are filled with powder, the English fuse being used to ignite it. The blasting takes place twice in the twenty-four hours; the machine is removed the fifty yards and returned to its place in ten minutes.

It requires a long time to get rid of the foul gases produced by the explosion of the powder: it is found that from one to four hours and a half are necessary to remove the vapours and the *débris*. From this cause not more than about 5 feet of the heading can be done per day on each side, at which rate the tunnel would not be done for ten years; but there are machines being made now which it is calculated will effect a saving in time of 30 per cent.; so that, if nothing unforeseen happen, the whole tunnel can be finished in about six years more; or, if new improvements are successfully introduced, it may be completed even in a less time still; and this will very probably be the case, for there are means of using the machines more expeditiously, and experiments are being made to see how far they can be taken advantage of.

However that may be, the great work is now assured, and it is only a question of time; the machinery is so perfect that everything goes like clockwork; and the great desideratum of making a long tunnel without shafts having been obtained, there need now be no further doubt about the success of such undertakings; and the Lukmanier and St. Gothard Tunnels will, there is no doubt, shortly be commenced.

The sides of the Mont Cenis Tunnel are being lined with the stone excavated in the tunnel itself, nicely worked; while the roof is lined with four rings of brickwork. There are niches and small magazines in the sides at intervals along the line.

I should state that there is a main tube which passes over the ten iron reservoirs, and is in communication with them by means of short pipes; this tube is continued to the far end of the tunnel, and conveys the compressed air to the boring-machines, into which the air enters by means of small pipes of vulcanized india-rubber. This main is supported at intervals by piers of masonry for about seven or eight hundred yards to the present entrance of the tunnel on the Italian side. In the tunnel itself it is fixed against the side wall by holdfasts, as is also a small tube containing the gas.

On the Modana side it was found that it would be too expensive to cut through the rock so as to make a canal for the purpose of bringing the water from a great height; the water is therefore pumped up by means of hydraulic power into a cistern about 86 feet high, which is the fall required to compress the air in the first instance to 6 atmospheres. Everything else is similar on both sides of the mountain. The machinery employed on the Savoy end of the tunnel is exactly the same as what I have described, and all the processes are precisely alike.

The machinery for the whole of this important work was made at the celebrated establishment of Messrs. Cockerell, of Liege; and they deserve the highest credit both for the marks of mind they have impressed on their work, and the beautiful finish and exactness of the details.

The tunnel has vertical walls and a semi-circular roof; the lining is carried about a foot below the roadway, and makes a mitre joint with the rock, so as to convert the substratum into a natural invert. The tunnel itself is 26 feet 3 inches wide in the clear, and its height in the centre is 24 feet 7 inches.

The total length of the heading on the Bardonèche side is 3,530 feet, while that on the Modana side is 2,620 feet; and the length of tunnel taken out to its full dimensions, lined and finished, is about 6,000 lineal feet altogether.

In the headings there are constantly employed at each face thirty men to direct and attend to the working machinery; six men and three boys are kept for the purpose of blasting the rock; and six additional men are occupied, when it is necessary, to remove the *débris* after the blasting has taken place; besides, there are numerous workmen, taking the tunnel out to its full dimensions, lining it, and so on.

The tunnel is at present in one straight line; but, in order to enable the trains to turn into the sharp valley, it will be necessary to have the entrance in a curve. The curved part of the tunnel is now being commenced, and will join the straight part at about 250 yards from its present temporary entrance on the Italian side.

I may mention that the heading is widened on both sides, and the roof taken out by ordinary miners in the usual manner; but in the course of time, machinery will also be used to bore the holes for blasting everywhere, which will greatly expedite the works.

The tunnel will have a continuous gradient, falling from the Modana end towards Italy, at the rate of 1 in 500. It is to be regretted that the approaches are so steep, being on an average 1 in 50 on one side, and 1 in 40 on the other. It would have been far better to have made the tunnel somewhat longer, so as to have avoided a continual source of wear and tear, both of trains and rails, which will be a perpetual charge upon the line.

The height of the tunnel at its entrance near Bardonèche, above the level of the sea, is 4,381 feet.

This immense gallery of magnificent proportions would make the finest exhibition building that could be constructed, and I would propose that, when it is finished, it should be inaugurated with a great International Exhibition. The different objects to be exhibited should be arranged along the centre, leaving the walls and roof free, with two wide passes at either side communicating with each other at intervals. Even although the centre should only be partially occupied, numberless objects of interest could be placed in a length of nearly nine miles; while the magnificent gallery would be an exhibition in itself,—a monument cut in the adamantine frame of the world.

THEBES AND ITS TOMBS.*

IT is a remarkable circumstance that, notwithstanding the multiplicity of Egyptian sepulchral remains in the various European museums, there is a want of authenticated details of the first opening of Egyptian tombs, or of the precise state of matters in such tombs when they were first opened. One of the chief objects which Mr. Rhind had in view in carrying out his researches in Thebes was to discover, if possible, some virgin tomb, if we may so call it,—one which no previous ransacker had ever entered; and he certainly took great pains to realize that object, and was pretty well rewarded too for his labour. First of all he chose places for excavation which, though close beside many other tombs in the rocky city of the Theban dead, would inevitably cost both time and money, as well as require determined perseverance, in their excavation; and so well chosen was one of these spots in these respects, that loads of detritus poured down into the excavation from above almost as fast as the material dug out could be removed. After seven weeks' labour of forty men, however, certain tombs were reached which it was evident, from the contents, had not been opened at least for many centuries. Even these, nevertheless, had not escaped, so far as regarded their original or most ancient contents. First of all a doorway was uncovered in the face of the rock, secured, and carefully built in and plastered with clay, sealed in regular rows with the seal of King Amunoph III. Even this tomb had been entered since the sealing, through an aperture which was soon discovered. The floors of an outer and an inner tomb were found strewn with bones, torn bandages, and fragments of mummies and mummy-boxes. Here some inscribed wooden tablets were found, containing names of princesses of the family of Thothmes III.; yet, strange to say, the tomb was plain, undecorated, and very unlikely to have been a royal tomb. How the tablets came to be where they were Mr. Rhind confesses he has great difficulty in conjecturing; but perhaps the remains altogether had been cleared out of a royal tomb to make way for royal or other successors, and carefully inclosed and sealed up, in Amunoph's time, where they were found.

The result, so far, Mr. Rhind rightly regarded

* "Thebes; its Tombs and their Tenants, Ancient and Present; including a Record of Excavations in the Necropolis. By A. H. Rhind, F.S.A. London: Longman & Co. 1862."

as somewhat vexatious and disheartening. Nevertheless he persevered with his excavations; and at length, after several weeks' additional labour, another built-up doorway was reached; and, notwithstanding certain unpromising signs, it was ascertained that here, at least, there *was* something worth the trouble. First of all, however, let us briefly describe the tomb itself, of which Mr. Rhind gives a section. The rocky hill had been penetrated, by the tomb-constructors, in the first place, horizontally, to a length of 55 feet, by a breadth of 8½ feet, and a height of about 8 feet. From the innermost end, where a massive wooden doorway still stood, a tunnel descended, with a curved sweep, for 70 feet in length; at the farthest end of which there was a perpendicular shaft, pit, or well, 10 feet by 6, and 20 feet in depth, leading down into another elongated chamber, or series of chambers, 56 feet in length, and in height nearly 5 feet; the roofs studded with calcareous and nitrous crystals. Reared above the well was an erection supporting strong beams, over which hung the very rope, of twisted palm fibres, which had lowered to their resting-places the last tenants of the sepulchre beneath.

In the outer and upper chamber was found a remarkable-looking object, unique in its kind so far as regards any discovery ever heard of by Mr. Rhind. He considers it to have been a funeral canopy. It is of wood, and brightly painted, and is in perfect preservation. This, with other antiquities, Mr. Rhind has placed in the Scottish National Museum at Edinburgh. It has the appearance of a shrine or a many-posted bedstead, with a curved roof; and at the head or principal end are three winged discs, one above the other, surmounted by a row of hooded or disced serpent-forms. The whole affair is gay with blue, red, and yellow colours. Near this canopy was found a double statue, in limestone, representing, according to the inscription, an officer of the police of the temple of Amun Ra, at Thebes, and his sister. There were also several viscera-vase-forms of stone not hollowed out.

On the sides of the tunnel were two cells walled up: on opening these a similar confusion was found with that in the sealed tomb already spoken of. The chief remains were discovered in the chambers at the bottom of the pit. There were several wooden coffins and mummies in an entire state; but the principal object was a sarcophagus of granite, which appeared as if filled with bitumen, but was found to contain the mummy of a man, in a gilt mask, and crowned with a chaplet of copper, gilt, with leaves of gold attached to it by pliant stalks. Beside the mummy and in the usual place was found a large ritual papyrus in excellent condition, and said to be philologically highly instructive. It declared the deceased to be Sebau, keeper or guardian of the royal *Khemu*, and in charge of the king's horses. Sebau, it states, was born on the 28th of the month Athyr, in the thirteenth year of the reign of Ptolemy Philopater III., or Dionysos. He died in the twenty-first year of Cæsar (Augustus). Thus he appears to have been born B.C. 68, and to have died B.C. 9. Of the other contents of the tomb we have no space to speak.

Mr. Rhind gives an interesting account of the tombs and excavations generally, both at Thebes and elsewhere in Egypt, including other excavations of his own; and also describes the living human tenants of the tombs.

One chapter is devoted to the theories explanatory of Egyptian sepulture,—a curious but obscure subject. Mr. Rhind, we consider, is right in thinking that a better knowledge of the peculiar religious doctrines of the ancient Egyptians would be requisite to enable us to appreciate those original motives which led to so elaborate and singular, as well as costly, a mode of sepulture as mummification. We are also persuaded that a comparison of the practices of other ancient nations with those of the Egyptians, in respect to the treatment of their dead, would aid greatly in clearing up certain mysteries connected with these practices. The interesting accounts we already have, and yet may have, for example, of those cities of the dead which seem to have covered all the site of the ancient and mystic Chaldea may be of service in this respect. It appears that while myriads of human beings were anciently buried in the Chaldean cities of the dead, not a single vestige of ancient sepulture has ever been found on the site of ancient Assyria, to the east of those sacred rivers, westward of which Chaldea lay; and it has hence been concluded that, in fact, Chaldea was the ancient burial-ground of Assyria; and that the Euphrates, like the Nile, was the highway of the dead. Again, while remains of burial-places *and temples* have been found on the Chaldean site, no vestige of any ancient private dwelling has there been found. Precisely so is it with respect to Thebes; and although there is historical reason to know that Thebes was a vast city of the living as well as of the dead, it is probable that the city of the living lay upon the eastern bank of the river, while we know that its city of the dead lay upon the western bank, just as it was with Assyria and Chaldea; and, although these latter names denoted districts of country, so even was it with Thebes,—a name,—at least the Thebais,—which once included all Egypt, if not Ethiopia also; from both of which the city was said to have derived its strength, and from both of which too, therefore, it also probably derived its dead. As for the process of mummification; for our own part, we are not only persuaded that it was closely connected in its origin with the peculiar religious doctrines of the ancient Egyptians; but we think we can see our way into the precise doctrines and practices which must have led to it. That an idea was at one time entertained amongst them of the possibility of the soul revisiting the body there can be little doubt. Thus, for example, the title of the 89th chapter of the Ritual of the Dead is rendered by De Rougé, "Chapter of reuniting the Soul to its body in *Ker Neter*" (the ordinary place of sojourn of the dead);* and Birch appears to understand this chapter as referring to the soul revisiting the mummy. But the next question is, How did they come to believe this; or, in other words, on what peculiar religious doctrine of the hierophants, or magi, was such a belief founded? The doctrine on which it was originally founded, we have little doubt, was that indicated by Iamblichus in his treatise on Egyptian Mysteries,† where he says that "in the contemplation of blessed visions the soul assumes *another life*, operates in another manner, and justly esteems itself *no longer man: it often exchanges* its own life for the most blessed life of the gods." Now this was a doctrine which not only implied a return of the soul to the body after it had entered "another life," but a *frequent* return; and hence, originally, it could not have well applied to the actually dead; and, in truth, it has been clearly shown in an article on Symbols in the *Builder* of 16th October, 1858, that it originally applied to those oracular *entrancements* during which the body was regarded to be *dead*, and dispossessed of its own soul, while suffused with the divine and oracular afflatus. That this doctrine did not originally apply to those who had died the death of corruption, therefore, there can be no doubt; but that it at length became confounded with such an idea is equally clear from the well-known allusions in the Ritual to the deceased *becoming* Osiris, which obviously meant originally the same thing as the entranced, and beatified, being "no longer man," but having become "the god" who delivered the oracles. It would appear, then, that the careful wrapping up of the dead, embalmed with aromatics, &c., was originally based on the magical doctrines connected with entrancement; and, in all probability, on *certain practices* adopted in reference to the entranced. The very practice of excavating cells in the rocks, which so much resemble those forming the dwelling-places of eastern *ascetics*, probably also originated in the same doctrines; as also their association with the temples, and with those priests of the temples, or colchyti, who had the care or ownership of the cells. Much more might be said in support and illustration of these ideas of the origin of the practice of mummification, were this a fitting place for such a disquisition; but we cannot here pursue such a subject farther; and must conclude by recommending Mr. Rhind's very interesting treatise to the notice of our readers.

* Etudes sur le Rituel—Rev. Archéol., vol. i. N.S. p. 85.

† "Iamblichus de Mysteriis Egyptiorum," ed. Gale, pp. 22—27.

THE PALACE OF ART AND INDUSTRY.

ARRANGEMENTS in the International Exhibition building are, we are obliged to confess, less advanced at this time than we anticipated. Any one examining the collection of iron girders shown in the French Court, by Messrs. Dupont & Dreyfus, must beware lest a hole in the floor do not cause an accident, such as that which entailed the loss of one valuable life; and those who are accustomed to dine after the work of the day, had better not think of finding anything to eat at moderate charges, or anything at all on tables below stairs except chairs and litter. The catalogue-publication departments, however, the foreign and colonial at least, appear to be working assiduously: catalogues of the Zollverein and Belgian divisions have now been added to the French and Austrian; and at last, in a Jury Directory, we discover, what we looked for in the Official Catalogues, and in the arrangement of the objects themselves, a "Detailed Classification of Objects sent for Exhibition." This classification, which is that, "with slight modifications," of the Exhibition of 1851, "rearranged so as to suit the more numerous classes and sections of 1862," would not be ours; but it may be made the basis of invaluable reports by the juries; it should be procured by every one desiring to study, and derive real benefit from, the Exhibition; and we only regret that a strange want of thought on the part of those concerned, allowed such a groundwork for any useful notices of objects displayed, to come only lately and accidentally to our hands. Mr. Palgrave's Handbook, for the preparation of which "all necessary facilities" were given, is now no longer sold in the building; but the official Fine Arts Catalogue with the objectionable matter to which we first drew attention, remains; and moreover the commissioners have said that they "arranged with Mr. Palgrave to write the introductory articles," and that "being satisfied with the knowledge and ability shown by him," they were glad to afford the facilities for the Handbook. It seems therefore necessary to point out to the commissioners, that *the* introductory articles, the only articles absolutely necessary, or such as would have informed the public what was the period of art-history and time embraced by each country's display of works, do not exist in the catalogue at all; whilst what is found, on the subject of architecture at least, is calculated to mislead the public, and even to retard progress to that general appreciation of what is valuable in the collective styles and schools,—to wit, *art*, for which the whole profession may be said to be striving. Now that the commissioners have avowed responsibility, which they have sought to disown in the case of the Handbook, it is for the committee who were intrusted by them with the arrangement of the architectural drawings, to say whether they are satisfied with Mr. Palgrave's representation of the present position of architectural art, and his substitute for facts and opinions stated by those conversant with the subject.

However, it is the sense of the value of the particles constituting the unassorted whole which makes expression of regret so often uppermost with us. An educational agent for the mass of promenaders—individuals ever needing to be reminded of the great world of arts which lies without their field of a single trade or calling; an agent for the demonstration of the fact that civilization and progress are not alone Anglo-Saxon or British; the Exhibition is less than it might have been with better arrangement of its contents, but is enough to constitute it at this moment much more and better than an ordinary "sight" of London. He who thinks to see it in a dozen visits, varied with the other attractions of town, may be something like the Turk who spends a season in London or Paris, or, to speak truth, like too many English who have been on the Continent; that is to say, set on his return homewards only blind to the reality and ultimate order of the images, and confirmed in his narrow ideas and prejudices.

Since our notices of some of the objects in Class 10 appeared, we have received communications respecting objects not named by us, or others about which we are thought to have been in error. Omissions are inevitable; for, we have not enough space even for titles. The fire-bricks, gas-retorts, sanitary-tubes, and terra-cotta, of Messrs. Ingham & Sons, of Wortley, we have not seen; though they may be as near to other specimens as are the works, near Leeds, of one firm to those of the other, and may be equally good. As to "Sanitary Tubes," the statement that those of the Darfield Pottery, Barnsley, are made up to 4 feet in diameter, and are tested when required to bear a pressure of 200 lb. to the square inch, is that of the manufacturer. It would have been well to name with other water-purifying agents in our last, Mr. F. H. Danchell's apparatus for filtering and softening, and for testing water. The filters are used generally in the building.

In a different division of this class, we find Mr. H. Barrett's (Fox & Barrett's) system of flooring not shown sufficiently to do justice to its merits; an assertion which might be hazarded of nearly everything in this class. Although the majority of the exhibitors offer printed information supplementing the curt and sometimes ridiculous titles,—such as "coating stone, wood, iron, &c., prevents decay,"—much of it requires substan-

tiating. Results of experience or experiment are too seldom stated. We should have been glad to know something of the cast-iron pipes of Messrs. T. Edington & Sons, of Glasgow, including the great main of the Glasgow Water-supply; and also of the pipes of the Bitumenized Water, Gas, and Drainage Pipe Company, which are inoxidable and one-fourth the weight of iron pipes. In effect, what are the advantages respectively of these two materials and stoneware pipes, iron itself being readily subject to collapse under a moderate weight of earth?

The greater number of the contributions to Class 10, by engineers, are models of iron bridges and viaducts, of which the principle of construction is remarkable for that subserviency of other considerations to one of rapid completion, which is generally of importance to shareholders. In most of these models, one of the forms of lattice-girder, or Captain Warren's diagonally-braced truss, as applied in many cases by Messrs. Kennard, is used, with piers likewise of iron construction. The Beelah Viaduct, Westmoreland, on the South Durham and Lancashire Union Railway, is illustrated in a model exhibited by Messrs. Gilkes, Wilson, & Co., of Middlesbro'-on-Tees. It was designed by Mr. T. Bouch, of Edinburgh. It is 1,000 feet long and 200 feet high in the deepest part of the valley, and was erected in four months. Three years, say the exhibitors, would have been required for the erection of a viaduct of brick or stone. Lieut.-Colonel J. P. Kennedy's "Elements Essential to Railway Success" is an exhibition of models and drawings of different bridges on the Bombay and Baroda Railway, also of iron. Sir John Macneill's bridge over the Boyne has its three main openings spanned by lattice girders at a height of 90 feet from the water,—the span of the centre opening being 264 feet. Each pair of girders, as in works of considerable dimensions, is cross-strutted over the line of railway, or so that the perspective, looking from one of the approaches of the line, somewhat resembles that of a tubular bridge. Messrs. Turner & Gibson, of Dublin, exhibit, besides iron roofs, balance rolling-bridges for railways over water and roads. Messrs. Hawkshaw & W. H. Barlow exhibit a model of the suspension-bridge proposed to be erected at Clifton, in which are to be introduced the chains from Hungerford Bridge. The work now being substituted for Hungerford Bridge will be no improvement to the view on the river, and may serve as a specimen of the little beauty that civil engineers are able to unite with new forms of construction. The Chepstow, and still more, the Saltash Bridge, by the late Mr. Brunel, of which models are shown, are chief examples of this conjunction, in these latter days, of great constructive skill with the very worst art. The centre span of the Chepstow Bridge is 300 feet; and each span of the Saltash Bridge is 455 feet. The system of trussing is analogous in the two cases; the roadway being supported somewhat as in a suspension-bridge, whilst a great collar-beam, between points of suspension of the chains, forms abutment aloft in lieu of prolongation landward, and anchorage to the ground. In the Saltash Bridge the tubes resisting the tension of the suspension-chains are not straight, but they rise in a curve equal in height to the curve downwards of the chains: thus, say the printed particulars (which, considering the interest and importance of all points in the application of the suspension principle, it is well to quote), "the weight of the girders and roadway rests half on the tube, half on the chains, the girders being carried by vertical struts placed at intervals of forty feet, diagonally braced so as to give rigidity, and by intermediate attachments to the suspension-chains." Not less important than the system of trussing is the economy of recently perfected methods of founding the piers of such bridges,—for example, the compressed air system of cylinder-sinking. Models both in the French and the Zollverein Divisions, show that like improvements, and on a vast scale, have been made by foreign engineers, and, it is fair to add also, like offences against good taste. The French, to whose works we may return, are nearly as bad as ourselves when they are not dealing with the arch-form in iron; whilst they seem to be equally able to dispense with scaffolding. Their court for public works of the empire, is now completed. There are 49 different illustrations of works of all kinds, too much crowded together, and some of the most interesting models difficult to be seen; but amongst the number we discover numerous models of iron bridges. In the Bavarian section of the Zollverein, though far away at the end of the Western Annex, is a model, to which we alluded in a former article, of one opening of the railway-bridge across the Rhine, at Mayence, exhibited by Messrs. Klett & Co., of Nuremburg. The Zollverein catalogue gives a view which shows that the whole bridge may compare with the Saltash for ugliness. The principle, called Pauli's System, seems to resemble that suggested in the course of the discussion at the Oxford meeting of the British Association, in the Mechanical section, after the reading of Mr. Barlow's paper on bridges on the suspension and combined girder principle capable of affording requisite strength for passage of railway trains. In this Rhine bridge we see, in each complicated arrangement of bars forming the truss, a descending curve following much the same line as the chain of a suspension-bridge; but riveted to form one piece in itself, or, rather, as part of the whole truss: the combination of rigidity with the catenary; or the substitution of that form of resistance to the tensile part of cross-strain in a girder or truss, for the chain with links, apparently realizing the suggestion of the speaker at Oxford. In the same Annex, and also belonging to the Zollverein Division, will be found a model illustrative of another important bridge of iron construction,—that across the Vistula at Dirschau. It is exhibited by the Berlin Minister of Commerce and Public Works. It is fully described in a volume, which, or a translation from it, should ere this have reached us, but may now come to hand too-late. There is a model, near this of the bridge, of a contrivance of very different sort, namely, one for raising vessels from one water-level to another without a succession of locks. The substitute is a carriage for the vessel, which is wound up an inclined-plane,—an old idea, but one to which objections have been raised, such as that of injury to the framework of the vessel in the transport. The carriage of course is drawn on a line of rails. It descends into water at the foot of the incline, where the vessel steams or sails on to it; the sides of the vessel may be wedged tight, the traction-rope is brought into play, and when the load reaches the top, the carriage again descends an incline into water to set free the vessel. This arrangement is in use at Elbing, on the Oberländische Canal. It is necessary to add that the vessels are flat-bottomed. The rise of the incline is between 60 and 70 Prussian feet. The arrangement has been in action about four years.

A large and interesting model in the British Division, Class 10, shows the course of the Tudela and Bilboa Railway across the chain of the Cantabrian mountains, in the Basque Provinces of Spain, as designed by Mr. C. Vignoles. With the aid of the sections which are hung on the walls, too far from the eye for proper examination, it is not easy to satisfy ourselves of the necessity for the circuit of perhaps ten miles, which the line takes to get back, after a required ascent, to near the original point; but favourable gradients have evidently been regarded as paramount in importance. The manner in which the line, onwards, is carried along the faces of steep cliffs, deserves attentive examination; and the work will give ample scope for ability in direction and skill in construction. Mr. H. Vignoles is the principal resident engineer, and Mr. T. Vignoles Croudace the assistant engineer; and the district engineers are Messrs. H. M. Mathews, and C. Bennison. Messrs. P. Skelton as artist, and Mr. S. Salter as modeller, deserve to be named. Mr. J. Chalmers exhibits a large drawing of his proposed Channel railway, connecting England and France. The project has already received some notice from us. One or other of the published designs for a passage of the Channel by a railway, is very likely we think to be attempted, before many more years have passed; and there will be hardly more serious difficulties in sinking tubes, in ventilating them, and in preserving them by submarine embankment, than once might have been, or were, seen to a tunnel under the Thames or through the Alps, or to the construction of bridges without scaffolding from the ground. Mr. César Daly, always working for union of every sort between the two countries, should be named as one of the pioneers of the idea of a sunk tube. His project will be found in his "*Revue Générale de l'Architecture.*" He incurred both expense and risk in studying the subject at sea, and has ever since regarded the idea as perfectly feasible.

Belonging to the class which includes bridges, should be named several models and photographs of suspension bridges, not all for the passage of railway-trains, which will be found in the British American divisions of the Exhibition, in the North-East Transept. The chief of the works of the class, of course, is a railway-bridge, that of the Niagara,—still not sufficiently appreciated, we think, by British engineers, and having, be it admitted, the defects which are sought to be counteracted by the chains anchoring the under-side of the roadway to the rock. Defects appear even in road-bridges, as disclosed in the photograph of the bridge over the falls of the St. John River, where we read the words, "Walk your horse." The bridges which have been erected on the suspension principle, in great number, in France, frequently bear a similar notification; and their weakness seems to be generally recognized. The defects, however, are not due to the principle. But the Pont Louis Philippe, at the western point of the Isle St. Louis, Paris, is now about being removed, a bridge of stone, and one of a single arch in iron, having been erected, each in a surprisingly short period of time, slightly to the east, over the two channels of the Seine, to supply the place of the suspension-bridge.

GOSSIP ABOUT THE INTERNATIONAL EXHIBITION.

THE half-crown days have brought greater numbers to the vast aggregations of art and manufactures in Brompton. Still I have not been impeded in my rambles through the building by the denseness of the crowd—far from it; and it is to be hoped that the shilling days will do something towards further popularizing the great International Exhibition of 1862; which at present has not proved so attractive to the multitude as it ought to have done. The Saturdays would have paid much better as half-crown days; while on Thursdays the price of admission might advantageously have been five shillings. A cheap Saturday (or at all events not a dear one) would have brought many visitors from the country with the usual return-tickets available from Saturday to Monday; while the Saturday half-holiday at all the public offices, and many private establishments, would have yielded thousands of half-crown visitors, who are virtually shut out by the five-shilling charge.

I have watched the gradual progress towards completion of the, so-called, Majolica fountain, and admire the general design. But why are three-fourths of it in stone? The crystal fountain of 1851 was, in all its essential features, wherever conspicuously visible, entirely of glass. The great advantages of majolica over stone or bronze, for a London fountain, consist in the resistance of the glazed surface to the deposition of soot, to the action of oxidation, or to the development of those lower forms of vegetation which destroy the beauty of stonework in moist situations. These advantages are to a great extent neutralized if a large portion of the work is to be simply of stone, which would soon blacken by the deposition of London soot, or become otherwise discoloured by atmospheric action, or greened by vegetation. The work, to be a real novelty, possessing the advantages which glazed earthenware appears to offer, should have been *entirely* of majolica, and not merely a stone fountain with majolica decorations. We have already seen glazed earthenware, in the shape of encaustic tiles, used to form the decorative features of stone or stucco buildings; and the effect is, judging from existing examples, generally very unsatisfactory.

Among the most beautiful objects designed merely for the purpose of ornament, are some vases exhibited by Mr. Barbedienne. Their most novel feature consists in their enamelled ornaments of Byzantine character, such as are found in the richer reliquaries and other decorations of the Greek Church, from about the tenth to the thirteenth century. The patterns are arbitrary, both in form and colour, but of rich, intricate, and sometimes flowing design; the colours being generally blue, purple, red, and green, in some cases relieved sparingly with white, the outlines of the masses of colour being gold. These enamels have the character of inlays, being level with the general surface of the object, and polished like the main material of which it is formed. One remarkable specimen of this work is a vase of the beautiful African alabaster termed onyx marble. It is a long vase, having a broad band of inlay enamel-work, of the richest possible colours, running round it. The execution is faultless, and the design of the enamel-work very characteristic, being in all probability a facsimile of some ancient example, perhaps from the massive metal binding of some precious manuscript. Another specimen of this rich enamel-work is a metal vase, the whole surface of which is covered with a Byzantine arabesque, similar in character to the illuminations found in Greek manuscripts of the eleventh or twelfth century. Both these objects are curiously beautiful; and their execution is so perfect in its finish, that they cannot fail to gratify the

eye. But then comes the reflection,—Is not this kind of art retrogressive? Is not this accurate and slavish reproduction of old works a trammel calculated to impede the development of original genius in design? I fear it is.

Another symptom of this worship of former phases of art is exhibited to us in the form of some capital steel-work, in accurate reproduction of suits of ancient plate-armour. In the French Court, and in a very conspicuous situation, is an array of Mediæval plate-armour, in the styles of the fourteenth and fifteenth century. The manufacture is one evidently established upon an extensive scale, so that an amateur may order a dozen suits, at per dozen, either in the Crecy, Agincourt, or Bosworth styles—*au choix*. We have, for some time, had manufactories of family portraits,—from the hard realisms of Holbein to the flowing gracefulnesses of Van Dyck, and even to the soft pastels of Latour,—revelling in their Pompadour head-dresses and fluttering draperies. This manufacture one may conceive to be thus carried on:—A few genuine old portraits are collected, as a fundamental stock; copies of which are then made in any number; being slightly varied, and varnished with dirty varnish, to suit the brisk demand of the *nouveaux riches* for old family portraits; which can thus be furnished at a very moderate rate. They have been done, I believe, as low as 20*l.* per dozen—very good things indeed—Wardour-street, or an agent in Holland, furnishing the old carved frames. Now, we have ancient family armour! of several epochs; you have only to choose: shall it be the suit your ancestor, in the direct line, wore at Agincourt? or, shall it be the iron casing worn by the founder of your wife's family, who (imprudent fellow) joined the cause of that wicked Richard, and lost most of the family estates which had been quite recently the spoil of some Lancastrian hero, crushed in those wars of the Roses? Take which you like; but you will get your family suits cheaper by the dozen—with a reasonable discount for cash payment. Mr. Granger, of the International Exhibition, and also of No. 11, Boulevard St. Martin, is the manufacturer of this modern-ancient armour; and its production, as clever workmanship, is irreproachable. It is archæologically correct; and very capital models have evidently been selected for imitation. There is nothing like the look of sham about it: it is real steel, and the effect altogether genuine. Allow me, "gentle reader," to recommend a couple of suits for the hall of your snug Gothic villa at Kingston-upon-Thames.

Much has been said about the pottery and porcelain, comparing the most striking products of the kilns of Minton and Copeland with those of the Imperial establishment at Sèvre. But there are a few matters connected with the subject which have not been dwelt on. For example, of the attempt to re-establish the manufacture of the exquisite Wedgwood ware. It is well known that Wedgwood's successful attempt to copy the celebrated Portland vase first led to the production of that class of work now known as Wedgwood ware; the chief characteristic of which consists in the introduction of graceful designs in low relief, upon a pale-blue or purple ground; the *bassi relievi* themselves being white. Of the first copies of the Portland vase only fifty were executed, for subscribers, at fifty guineas each. These have gradually been getting rarer and more rare, and more and more esteemed—perfect specimens selling readily for something like two hundred guineas; while other specimens of work of that class—in cups, vases, porcelain cameos, and other ornaments—have been sought with equal avidity by collectors. This demand has induced the re-establishment of that style of work; and, consequently, the Wedgwood stand displays some very good specimens, principally copies of the old Flaxman designs; but there are a few original works. Neither the reproductions, however, nor the new designs, are at all equal to the old work. They are made to suit the present low range of prices; and yet, though they are very beautiful, they do not appear to hit the public taste. For the connoisseurs of the fine old specimens they lack the requisite high finish so remarkable in the real works; and for the general public they are too "quiet." The taste has fairly set in for the high colours of majolica and Raffaelle ware, and the elaborate richness of the Palissy style; and so, as I heard from an experienced connoisseur who was buying the modern Wedgwood work pretty freely, the fabrication of the new ware is not likely to be continued, and will therefore, sooner or later, become scarce; and then the lucky purchasers of new Wedgwood will find themselves in possession of rarities scarcely secondary in interest, or perhaps even in value, to the old. I verily believe my friend, a very cautious gentleman, was purchasing by way of investment.

My attention was accidentally called the other day to an entirely new feature in porcelain, introduced by Mr. Chablin, of Paris. This new feature is an incrustation of solid gold or silver ornaments in the enamelled surface of the porcelain. Wreaths, medallions, or groups of flowers are cut out in thin silver, and, after being richly chased, are placed upon the china in the situations intended by the designer; and then, with the silver *appliqués* well secured in their proper places, the china is again packed in usual vessels of fire-clay, and re-submitted to the action of the kiln or furnace. At a precise degree of heat, when the metal and the enamelled surface are both approaching the state when fusion commences, the adjoining surfaces of the metal and enamel blend, and adhesion takes place. A moment more, and actual fusion would ensue. The work must, therefore, be instantaneously withdrawn, or utter destruction would follow. How to ascertain the precise moment is the difficulty. There or thereabouts will not do, as in ordinary cases of china-baking; and to meet this difficulty Mr. Chablin has invented a means of watching the gradual heating of his work while in the furnace. Whether this be effected by means of a long steel tube attached to a small aperture in the side of the covered vessel of fire-clay in which the work is being baked, and through which the operator can look, from outside the furnace, into the interior of the covered vessel itself,—or whether the observation be effected by some other means, is a secret in the keeping of Mr. Chablin, who is moreover protected by his *brevet d'invention*. Whatever may be the precise means employed, the result is a very beautiful novelty. It has a graceful Pompadourist air of *grande-damerie* about it which is very taking. The incrusted devices of silver or gold are re-chased after they come from the furnace, in order to restore the sharpness partially lost in the proximate fusion. The heightening of the effects of porcelain-painting by the introduction of gold has long been a principle sanctioned by the beautiful effects produced. If, then, the use of gold or silver, by means of such mere gilding as, in course of time, will wipe off, be admissible, *a plus forte raison*, the introduction of metallic effects in a more permanent form, and which, moreover, imparts an additional protection and solidity to the china, may be accepted as a legitimate innovation and novelty.

I cannot say as much for a new kind of jewelry, of which specimens are exhibited. I cannot consider as legitimate the mounting of gems in ivory. It is a novelty for the mere sake of novelty, and nothing more. Metal, of some kind, has long been accepted as the only proper setting and protection for gems, the reasons for which are obvious, but would require too much space for recapitulation here. Nevertheless, these aberrations of the jeweller's art will, doubtless, have their fashion. There is a picquant barbaresque something about them that has its fascination. A necklace of squirrel's teeth, with a diamond incrusted in each tooth, had, doubtless, a charming effect upon the bosom of a Peruvian beauty; and why not, therefore, try turquoise and emerald, mounted in elephant's tooth, as a bracelet for the wrist of an Anglo-Saxon lady of fashion?

The greatest failures in the imitative style of ornament are always those pretending to one or other of the oriental manners,—Moresque, Turkish, or Persian. No European, with the exception of Mr. Owen Jones, in his exquisite Alhambraic reminiscences, has at all seized the true spirit of oriental design. Even where slavish reproduction, and nothing more, has been aimed at, something or other—some little unconscious modification—always ruins the true orientalism of character.

Two or three examples could be mentioned open to these strictures in some otherwise beautiful works, especially some vases which may be seen among a mass of works in silver and silver-gilt, displayed in the English Bullion Court. This incorrect and unappreciative treatment of oriental styles reminds me of M. Paul de S. Victor's criticism of Moore's "Lalla Rookh," the oriental scenery of which is open to similar criticism. M. de S. Victor says,—"He makes sham orientalism after an artificial manner of his own, just as perfumers mix up their 'Sultana paste.'" And so it is with pretended imitations of oriental art,—certain conversions are, in fact, practised and accepted in lieu of it.

Some of the large shields executed by Messrs. Elkington, and by Messrs. Hunt, Hancock, and others, should be sought for by amateurs of fine silversmiths' work. Some of these, of mighty size, remind one of the Miltonic Satan's buckler. They are very orbs in size and grandeur; some of which are designed as prizes for the national rifle matches, which will call forth the genius of our artificers in silver and gold to furnish forth emblematic trophies of a high class of art of this form. And what more appropriate than the shield form as a trophy among volunteers, who are a defensive, and not an aggressive force? In some respects the English shields are superior to the great Rhenish shield presented by the cities of the Rhine to our Princess Royal of Prussia, and upon which the most skilful designers, chasers, and modellers of Berlin have been employed.

But people are not only thinking of shields, emblematic of defensive war; crowds assemble, from the opening to the closing of the Exhibition, round the beautifully-finished Armstrong gun. The French talk of an Egyptian steel gun, manufactured at Cairo, which carries a 60-lb. ball 6,200 mètres. It has just been presented to their Emperor by Said Pasha, and is going to be tried immediately at Vincennes. Our Trans-Atlantic brethren, of whom a good sprinkling are generally present, speak of the far more powerful American gun, named the *Lincoln*, and which is calculated to project a spherical ball of 437 pounds weight to an immense distance, with crashing effect. The first ball projected was intended for the *Merrimac*, had not that fearful engine committed suicide in despairing anticipation. One sees in the creation of fearful instruments of destruction of this kind the coming end of the horrors of war. When every *Merrimac* has found its *Lincoln*, and still more hideous engines have found their match; and when thousands must inevitably fall before a single discharge of such weapons as can now be readily imagined possible, though not yet realized; then the old war of force will necessarily give place to wars of reason, and a new era will be inaugurated.

Great regret is expressed that none of the new wines, the names of which are so ostentatiously announced by the growers, are to be tested otherwise than by the names in the catalogue, assisted by the aspect of the nicely-arranged bottles, with their pretty labels. Wines from the Tokay country, at prices varying from 18s. per dozen upwards, appear very tempting, especially just after one has read in the *Kölner Zeitung* that thirteen pipes and nine half-pipes of hock have just realized, at the annual sale at Castle Johannisberg, the sum of 96,000 francs.

French mistakes and misconceptions regarding everything English continue to entertain all visitors to the Exhibition who are on the look-out for amusing blunders. The English catalogue of Mr. Barbedienne's beautiful works of art affords some curious specimens. "*Fire-pieces*," for instance, are not, as one might expect, small Armstrong guns, or explosive machines of any kind. The term "fire-pieces" is, in fact, the French-English for grate furniture; and "*Tweezers-holder, in Greek style*," refers to a pair of tongs of Grecian design. The section of the catalogue devoted to chandeliers, &c., is headed "Luminary." The beautiful Byzantine enamels are described as "*Opaque enamels, put together and smoothed in the antique style*;" and another exhibitor describes a statue produced at one casting, as "made at one spout." This is almost on a par with a new French satire upon the Confederate Government in America, in which the interlocutors are *Sir Jobson*, *Sir Gibson*, and *Sir Boxman*.

The French feuilletonists are still hard at work, some of them dealing out rather hard lines to our Royal Commissioners, and others turning their visit to our International Exhibition into a mere *jeu d'esprit*. Of this last class some are very amusing. A Mr. Plumet is made to arrive by a trip train from Paris, with his wife and daughter. His visit—for he has been prompt in his attendance—happens on a guinea day; and his innocent surprise at finding the three admissions amount to "*soixante dix huit francs!*" is very droll. Having paid this exorbitant sum, they determine to see all they can for it, and consult together upon the best method of scheming out their day's work. Madame and Mademoiselle Plumet are for first visiting the "textile fabrics," including, of course, the Lyons and Macclesfield silks, and the Chantilly and Honiton laces. But Mr. Plumet is determined not to encourage a taste for "*luxe*" in his wife and daughter, and prefers the machinery. Mademoiselle exclaims that it will not be *tres amusant*; "but," retorts Mr. Plumet, "it will be instructive;" and he of course prevails. The attendant at a new steam printing-press calls the notice of the foreign family to the fact that it prints with unprecedented rapidity upon paper, muslin, wood, or lead. Mr. Plumet caustically remarks that the English jour-

nals are already heavy enough, without printing them upon lead; and, delighted with this telling remark, he takes out, with a flourish, his best cambric handkerchief, which had been carefully put in his breast-pocket by Madame Plumet in honour of the great occasion, and delicately wiped his face after the exertion. "Allow me a moment, sir," says the attendant at the machine,—"allow me your handkerchief for a moment." Mr. Plumet resigns it unsuspiciously. It is whisked through the machine in an instant, and the attendant, with a deferential bow, returns it, spread out, to its owner. "But what is this—what is this in the middle?" exclaims Mr. Plumet. "It is the name and address of the inventor, in three well contrasted types—Egyptian capitals, old English, and small pica." "*Parbleu!*" exclaims M. Plumet, getting very red; "and what is this,—this horrid black patch?" "That, sir, is a large and correct model of the machine itself." "But, sir, let me tell you," exclaims M. Plumet, "that you make very free with other people's property,—*sur ma parole*, sare!" But here Madame Plumet interposes; she fears a serious dispute, and knows that her husband is no *boxeur*. "Tell me," she says, in a persuasive tone, to the attendant,—"assist me to explain to monsieur that this will easily wash out—that a little soap and water——" "Never, madame," replies the attendant, with serious and confident composure; "never, madame: our ink is indelible." But enough of Mr. Plumet.

A fact just heard convinces me that, as I have said above, the Exhibition will become popular with the shilling days; the first symptom being, that 48,000 members of Foresters' clubs belonging to the Midland counties have applied for admission on two consecutive days, if their application can be met on economical terms.

TWO OLD BRIDGES OF THE THAMES.

THERE are two old wooden bridges over the Thames, with a perfect forest of timber piles, picturesque and romantic enough to look upon; but if murderers ever deserved condemnation and destruction, these are two criminals of the first water, and we summon to the bar of justice the bridges of Battersea and Fulham. Too long have they encumbered the earth, or, rather, the water, with their baneful presence. We will try the last criminal first, as being by far the greater delinquent of the two. Before its doom is sealed it may not be amiss to place upon record a short account of its history. Anterior to its existence all communication between the opposite shores of Middlesex and Surrey was carried on by means of a ferry to and from the towns of Fulham and Putney. The building of the bridge has been erroneously attributed to Edward Gibson, Bishop of London; and it most likely he had much to do with it, for he was an active and intelligent man of business, as well as a most enlightened prelate, and would have been Archbishop of Canterbury but for some offence he gave to the minister, Sir Robert Walpole, in respect of the Quaker Bill; he edited two editions of Campden's "Britannia," one in 1695, another in 1722, besides producing other antiquarian and topographical works. But the credit or the discredit of erecting the bridge itself, belongs to a man equally celebrated, in his way, with the bishop. The plan of it was designed by the well-known surgeon and anatomist, Mr. Cheselden, of Chelsea Hospital, and it was considered at that period an additional proof of his great general ability. Phillips, a builder, much employed by George II., executed the work at a cost of 23,000*l*. It was begun in 1729, and finished in the same year; is about 789 feet long, and averages 24 feet wide. The centre and largest opening for the passage of vessels is not more than 30 feet wide; but it is dignified by the name of the "Walpole Lock," in compliment to Sir Robert Walpole, through whose influence the Act of Parliament for building it was obtained. There are only two smaller openings or passages for vessels, about 25 feet wide, and they are called locks, not arches; that would have been a misnomer, for the headings are necessarily flat. The other locks run to about 10 or 15 feet wide only, and are useless, except as so many traps to catch the unwary vessels that are by no means unfrequently entangled in their meshes. There were certain vested rights which had to be provided for on the erection of this structure. The Duchess of Marlborough received 361*l*. 10*s*. for her interest in the ferry, as lady of the manor of Wimbledon. The Bishop of London had 23*l*. for his interest on the Fulham side of the river; besides which he reserved to himself and his successors the privilege of passing toll-free, not only for himself but all succeeding bishops, their families, households, and all persons of whatsoever description employed in the palace or grounds, whether permanently or temporarily; and as the toll is a heavy one, more particularly for carriages and horses, it was a reservation very well worth the while of even a Bishop of London making.

The mode of passing the Cerberus who guards the gates of the bridge is by exclaiming "bishop," and this magic word is the "open sesame" for all who use it. The bishop himself is, of course, sufficiently well known to pass without question.

There is a sum of 62*l*. paid annually out of the bridge revenues to poor watermen, their widows, and children. In addition to this the proprietors had to pay for the purchase of the ferry the sum of 8,000*l*. The sovereign had to pay 100*l*. per annum in lieu of toll over the bridge for himself and household. We should imagine this toll does not now exist; but the troops passing over are charged as other persons would be—the bridge being now private property. The free watermen still ply their boats as a ferry for any passengers who may prefer that mode of passing over the river to that of the bridge; and with the produce from this source, and the letting out of boats for hire, they make a very comfortable livelihood.

One very important feature was overlooked in the construction of this bridge, and which had it been erected with so slight an impediment to navigation as three openings instead of twenty-six, the existing number, it would have been fatal to its utility. The current of the river at this part sets in very strongly towards the Fulham shore; consequently vessels would naturally be carried to this side; to meet this difficulty the bridge should be so constructed as to cut the water in an opposite direction, or up the stream; whereas the very reverse is the case with the present structure: its direction, instead of being up the river, is down it; and this is one great and fertile cause of so much mischief, for vessels are very frequently driven against the piles of the bridge on the Fulham side, when they believed themselves to be in the right direction to pass through the lock they were making for, and do not indeed find out their mistake till it be too late to rectify it; and such is the force of the current that they are fixed immovably to the bridge, till assistance is obtained from the shore to release them, an operation which is frequently attended with much damage to the vessels, sometimes to the bridge itself; and not by any means unfrequently with loss of life. Sometimes the vessels get so hopelessly entangled among the piles of the bridge, that they are unable to free themselves, consequently they cannot rise with the tide, which soon covers them, and the vessels, being at the time most probably heavily laden, sink to the bottom of the river. Again, during the high tides there is not height or headway enough for the steamers to pass under, consequently they are obliged to wait and beat about till the falling of the tide allows them to pass under the bridge. Accidents, indeed, are so numerous that the retention of this inconvenient structure is incompatible with the increased and increasing traffic on the river. The season on the river has now commenced, its opening being usually at Easter, and with it has begun the long chapter of accidents, which will continue till its conclusion. No less than *nine* boats were carried with the full force of the tide against the dangerous piers of this bridge on Easter Monday; one was at a single blow broken in two halves right through the middle, and its occupant precipitated into the water, and but for the accidental presence of a waterman, who was at hand, would have been drowned. Another boat was not so fortunate: one of its crew was by the surge precipitated into the river, and sank to rise no more, among the piers of this bridge. These sort of things are, more or less, an every-day occurrence. The inconvenience to navigation is a crying evil; the traffic on the river has more than trebled during the last twenty years; at the commencement of this period there were only two steamers to Richmond daily, now there are steamers every half hour, besides tugs, winter and summer, with their trains of barges behind them; but the greater difficulty exists in those which have to use sails or oars, and these are by far the greater number. But, alas! this old bridge is not the only evil that besets the navigation of the river. The *Scylla* has a *Charybdis* for about a hundred yards from this bridge another has been constructed by the Chelsea Water-works Company, for the purpose of carrying over their pipes; so that the unlucky vessels which have to shoot these two bridges, a more difficult feat than the celebrated shot at old London Bridge, finds by the time he has got his stern free from the aqueduct, his head is entangled in the meshes of the old bridge. How this second unsightly evil could have been permitted to spring up in the face and eyes of so much difficulty already existing, is a matter of surprise to most; certain it is that it occupies the place where the bridge of traffic should be, excepting that the Fulham end of it should terminate about eighty or ninety feet higher up the river, bringing it in a direct line from the High-street of Putney to nearly opposite the Vicarage of Fulham.

To this it must at last come; and this can only be done, as it seems to us, by an union of the two bridges,—namely, of the water bridge and the bridge of traffic. Be that as it may, we only point out a well-known and intolerable evil, and one that imperatively calls upon those whom it may concern to find a speedy remedy for.

The very serious objections which exist as to the Fulham Bridge apply in the main to that of Battersea, but it must be owned, in a less degree, the obstructions to navigation, in the latter case, being to some extent mitigated by the bridge having more openings in it for the passage of vessels. We believe all the locks of the Battersea structure are available for the passage of craft; so that, taken as a whole, it might be tolerated some little time longer; while the existence of the Fulham Bridge is a nuisance that requires the most prompt attention. Its days should be numbered: there can be but one opinion on this subject.

WESTMINSTER BRIDGE.

AFTER repeated delays,—which, to some luckless individuals, would have brought heavy objurgations, but for the fortunate engineer of Westminster Bridge simply afford the opportunity for fresh volleys of praises and wonder-causing statistics,—the whole width of roadway has been opened to carriage traffic. Pedestrians still pass over the temporary wooden bridge, erected on the north side of the permanent work pending the completion of the footways. These are being paved by Mr. England with 11-inch tiles, made by Mr. Blashfield, laid diamond-wise, within a granite curb. As to the construction,—fully described by us, and illustrated on previous occasions,—we helped to carry the engineer through his difficulty when he had one; but in respect of the appearance of the bridge we cannot fall in with the loud chorus of admiration. It would have been all the better for a little extra height over the crown of the arches, amongst other things; and then the parapet, which is at this time dangerously low, and calls for alteration, might have been formed higher. The width of the bridge is its great merit.

THE WESTMINSTER CHAPTER HOUSE.

YEARS ago we pointed to the disgraceful condition of the Chapter House, Westminster Abbey; and again and again, since then, have described its beauties originally, and urged the desirability of its restoration. A movement is being made with this end in view; but how it may result we are not prepared to say. An influential meeting was held within the building on Saturday last. Lord Ashburton presided, and introduced the subject. Mr. Scott pointed out the features of the building, and the ease with which it might be restored. He said he had been enabled, by the kind assistance of the Government officials who had formerly had charge of the building, and especially of his friend, Mr. Burt, of the Record Office, whom he was happy to see present, to obtain all the information necessary for him to lay before the meeting. He found that the building had been finished in the year 1253, for there were the bills of that date still preserved for purchasing the canvas for filling in the windows for stained glass. At that period this was the first finest specimen of octagonal chapter-houses. That of Lincoln was as large, but was not so good; and that of Salisbury had been built twenty years later. Its size was the same as those of Lincoln and Salisbury, and its proportions had been founded on the strictest mathematical principles. The windows were of stained glass, and the roof was vaulted, with a central column, still remaining, of Purbeck marble. He had spent several months in tracing out the whole of the building, with the kind assistance of those by whom it had until recently been occupied—and here again he would acknowledge the aid he had received from Mr. Burt—and he had been enabled from that investigation to arrive at the conclusion that he thought it possible to restore every portion of the design with the most perfect certainty. The only window which had been really thoroughly de-

stroyed was that over the doorway, which, having been thus shortened, must of necessity have been of a different design. There was no difficulty at all about the others. The decorations with which the walls had been covered were in the most beautiful style of art. The paintings were not quite coeval with the building, being painted in the beginning of the fourteenth century—half a century later than the building itself. There was nothing in this country equal to those that remained, and they were nearly, if not fully, as fine as the Italian paintings of the same period. The first represented Our Lord, as if after the crucifixion, surrounded by angels. The side compartments were entirely composed of groups of angels, there being one large figure in each group, on the feathers of whose wings were inscribed the principal virtues. Those happily remained perfect. Then the floor presented the very finest specimen of encaustic tiles. Happily, the exact sections of the ribs of the vaults were discoverable, so that the whole of the structure and the size of the windows were a matter of certainty, and, though in a mutilated form, there were all the paintings and decorations.

The following resolutions were passed,—Lord Stratford de Redcliffe, Lord Taunton, the Bishop of Oxford, and others taking part in the discussion of them:—

"That this meeting views with regret the ruinous condition of a building so rich in historical interest and in architectural beauty as the Chapter-house at Westminster."

"That this meeting is impressed with the desirableness of bringing the question of the restoration of the Chapter-house under the consideration of her Majesty's Government."

The second resolution at first contained, in addition, "as well as of Parliament and the public generally;" but this was, unwisely, removed.

A committee consisting of the following gentlemen was then appointed "to wait upon the Chancellor of the Exchequer, and otherwise to promote the object of the meeting:"—Duke of Buccleuch, Lord Ashburton, Lord Stratford de Redcliffe, Bishop of Oxford, Lord Taunton, Lord Stanhope, Mr. Monckton Milnes, M.P.; Mr. Akroyd, Mr. Dasent; Mr. Tite, M.P.; Mr. Reeve, Mr. Beresford Hope; Mr. Cochrane, M.P.; Mr. Sala, and the Dean of Westminter.

The Dean of Westminster read the following statement, which was agreed to:—

"*To the Lords Commissioners of her Majesty's Treasury.*

The memorial of the undersigned showeth,—

That the undersigned, residents in and visitors to London, view with great regret the dilapidated and ruinous condition of the Chapter-house of Westminster Abbey, a building which has been for many centuries in the occupation of the Government, and which is alike valuable for its architectural beauty and for the historical interest attaching to it as the habitual place of meeting of the House of Commons during the Plantagenet and early Tudor dynasties.

That your memorialists would further represent to your lordships that the grievous injuries which this building has suffered have been mainly inflicted upon it in the adaptation of it to the custody of public records; and that the records which it formerly contained have now been removed to the new Record-office; while the Chapter house itself has been declared by competent authority to be unfit for the custody of papers, from the risk of fire which it presents.

Your memorialists therefore venture respectfully to suggest that advantage should be taken of the present occasion to forbid the future use of the Chapter-house for objects for which it is peculiarly unfit, and to prepare the way for its future restoration. The mere removal of the incongruous fittings with which the building has been crowded would bring to light many of its ancient and ornamental features.

Your memorialists would further venture to suggest that the restoration of an historical monument of so much beauty and importance is an object for which your lordships might well, in the exercise of your discretion, invite the liberality of Parliament."

Copies of the memorial, which have been already numerously signed, lie for signature at Messrs. Colnaghi's, 13, Pall-mall East; Messrs. Vacher's, 29, Parliament-street; and Messrs. Parker's, 377, Strand.

THE SOCIAL SCIENCE CONGRESS: AND THE CONGRES DE BIENFAISANCE.

THE Congress will be opened next week, under the presidency of Lord Brougham. The following is the plan for the meetings:—

Thursday, June 5th — Opening meeting in Exeter Hall, at 8 30 p.m. The President will deliver his address; and other distinguished persons will take part in the proceedings.

June 6th—The Departments will meet in Guildhall, at 11 a.m., for the reading of papers and discussion. Evening discussions at Burlington House, at 8 30 p.m.

June 7th—The Departments will meet in Guildhall, at 11 a.m. *Soirée* at the Palace at Westminster, at 9 p.m.

June 9th—The Departments will meet in Guildhall, at 11 a.m. The *Congrès* will meet in Burlington House, at 11 a.m. The President (Lord Shaftesbury) will deliver his address. Evening discussions at Burlington House, at 8.30 p.m. *Soirée* at the Royal College of Physicians.

June 10th—The Departments will meet in Guildhall, at 11 a.m. Annual meeting of the Ladies' Sanitary Association, in the Public Health Department, at 2 p.m.; the Lord Mayor in the chair. The *Congrès* will meet in Burlington House, at 11 a.m. Evening discussions in Burlington House, at 8.30 p.m. *Soirée* at the Hanover-square Rooms, by the Reformatory and Refuge Union.

June 11th—The Departments will meet in Guildhall, at 11 a.m. The *Congrès* will meet in Burlington House, at 11 a.m. Evening discussions at Burlington House at 8.30 p.m.

June 12th—The Departments will meet in Guildhall at 11 a.m. The *Congrès* will meet in Burlington House, at 11 a.m. Evening discussions at Burlington House, at 8.30 p.m.

June 13th—The Departments will meet in Guildhall, at 11 a.m. The *Congrès* will meet in Burlington House, at 11 a.m. Concluding meeting of the Association in Burlington House, at 8.30 p.m.

June 14th—Dinner for the Association and the *Congrès* at the Crystal Palace, Sydenham.

PRITCHARD MEMORIAL, SHROPSHIRE.

THE fund collected at Broseley, Bridgnorth, and the neighbouring parts of Shropshire, amounting to nearly 3,000*l.*, is to be devoted to two distinct objects in memory of the late Mr. Pritchard, high sheriff of the county.

Firstly. In the erection of a memorial church at Jackfield, near Broseley, for which a design by Mr. Blomfield, of London, architect, has been selcted in competition.

Secondly. Designs have also been invited for a memorial building to be erected in the centre of Broseley, over a well and reservoir that have lately been constructed for the purpose of supplying the town with water. The first premium, of 20*l.*, has been awarded to Mr. R. Griffiths, of Bridgnorth, architect. A second premium of 5*l.* was also unanimously awarded to Mr. Wm. Thursfield, of Broseley, accompanied by a vote of thanks from the memorial committee "for the time and attention he has given to the preparation of the admirable set of working drawings for the memorial building."

ON THE IGNITING POINT OF COAL GAS.

In consequence of the recent explosion in Holborn, Dr. Frankland has experimented on this subject, and the results arrived at are thus summed up:—1. Coal gas cannot, even under the most favourable circumstances, be inflamed at a temperature below that necessary to render iron very perceptibly red-hot by daylight in a well-lighted room. But this temperature is considerably below a red heat visible in the open air on a dull day. 2. This high igniting point of coal-gas, under all circumstances, is due in a great measure to the presence of olefiant gas and luminiferous hydrocarbons. 3. The igniting point of explosive mixtures of the gas of coal-mines is far higher than that of similar mixtures of coal-gas; consequently, degrees of heat, which are perfectly safe in coal-mines, may ignite coal-gas; hence, also, the safety-lamp is much less safe in coal-gas than in fire-damp. 4. Explosive mixtures of coal-gas and air may be inflamed by sparks struck from metal or stone. Thus an explosion may arise from the blow of the tool of a workman against iron or stone, from the tramp of a horse upon pavement, &c. 5. Explosive mixtures of coal-gas may also be ignited by a body of a comparatively low temperature, through the medium of a second body, whose igniting point is lower than that of coal-gas. Thus sulphur, or substances containing sulphur, may be inflamed far below visible redness; and the contact of iron below a red heat with very inflammable substances, such as cotton waste, may give rise to flame, which will then, of course, ignite the gaseous mixture.

THE COMPETITION DESIGNS FOR PROPOSED LAW COURTS, BRUSSELS.

IN the early part of the year 1860 the Belgian Government, wishing to reunite all the courts of justice in a central position in Brussels, advertised a competition, open to all the world, in order to obtain the designs best adapted to the purpose. There was no limit to the amount to be spent upon the building; and the site was almost equally undetermined; competitors being asked to report or give their opinions on several sites chosen by eminent Belgian engineers. That which seemed to have found most favour with the authorities was the idea of M. Groeters, and was a large area near the Boulevard de Waterloo, approached by a wide street forming a prolongation of the Rue Royale, and being connected with the Hôtel de Ville by means of a long and handsome new street running off in an oblique direction.

The requirements of the Belgian Government were very numerous and very explicit, and consisted of no less than nineteen courts, with their offices and various dependences; and the premiums offered for the three best designs were respectively 480*l.*, 240*l.*, and 120*l.* The designs were to be merely sketches (*avant projets*), and a certain latitude was allowed in order that architects might be unfettered in their ideas. Such designs as did not fulfil the conditions of the programme were to be rejected from the competition; and the premiated designs were to become the property of the Government, who reserved to themselves absolute right over them.

After the Belgian Government had fixed the time for the reception of designs as August 1st, 1860, they extended the time to October 1st, 1860, at the last moment, and actually after designs had left this country for the competition, and without any official notice to competitors out of Belgium of the circumstance.

In answer to their advertisement the Government received a number of designs, twenty-eight of which were admitted to the competition; and a jury was appointed to consider and report on the designs, and on the award of the premiums. The jury reported on the 21st of May, 1861, to the Minister of Justice, "That, of the designs submitted in competition for the proposed Palais de Justice, they considered the best to be as follows:—

1. The design of Mr. Louis Backelmans, of Antwerp.

2. That of Mr. P. Gourerts, of Brussels.

3. That of Messrs. W. J. Green and Louis de Ville, of London.

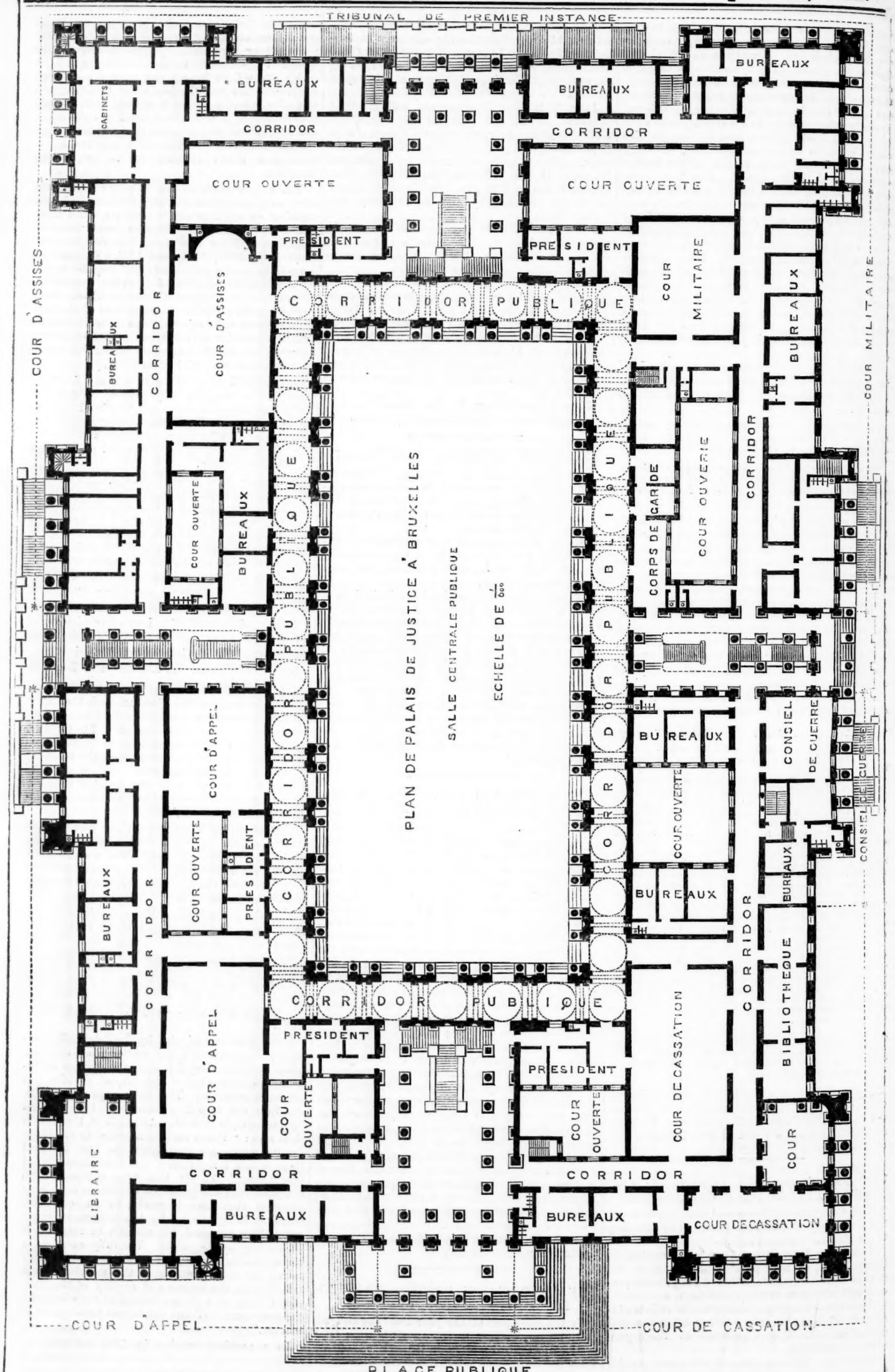
That it is from the fine art point of view that the competition has left most to be desired; that the authors of design No. 21 (Messrs. Green & De Ville) have understood better, perhaps, than any of their competitors the meaning of '*la grande architecture;*' and that 'the monumental character of the façades, and the disposition of the central hall and its four entrances are remarkable.'

That of the twenty-eight designs admitted to the competition there is not one which sufficiently fulfils the conditions (*remplir d'une manière assez complet les conditions*) of the programme; and that, therefore, the jury recommend that the premiums be not awarded.

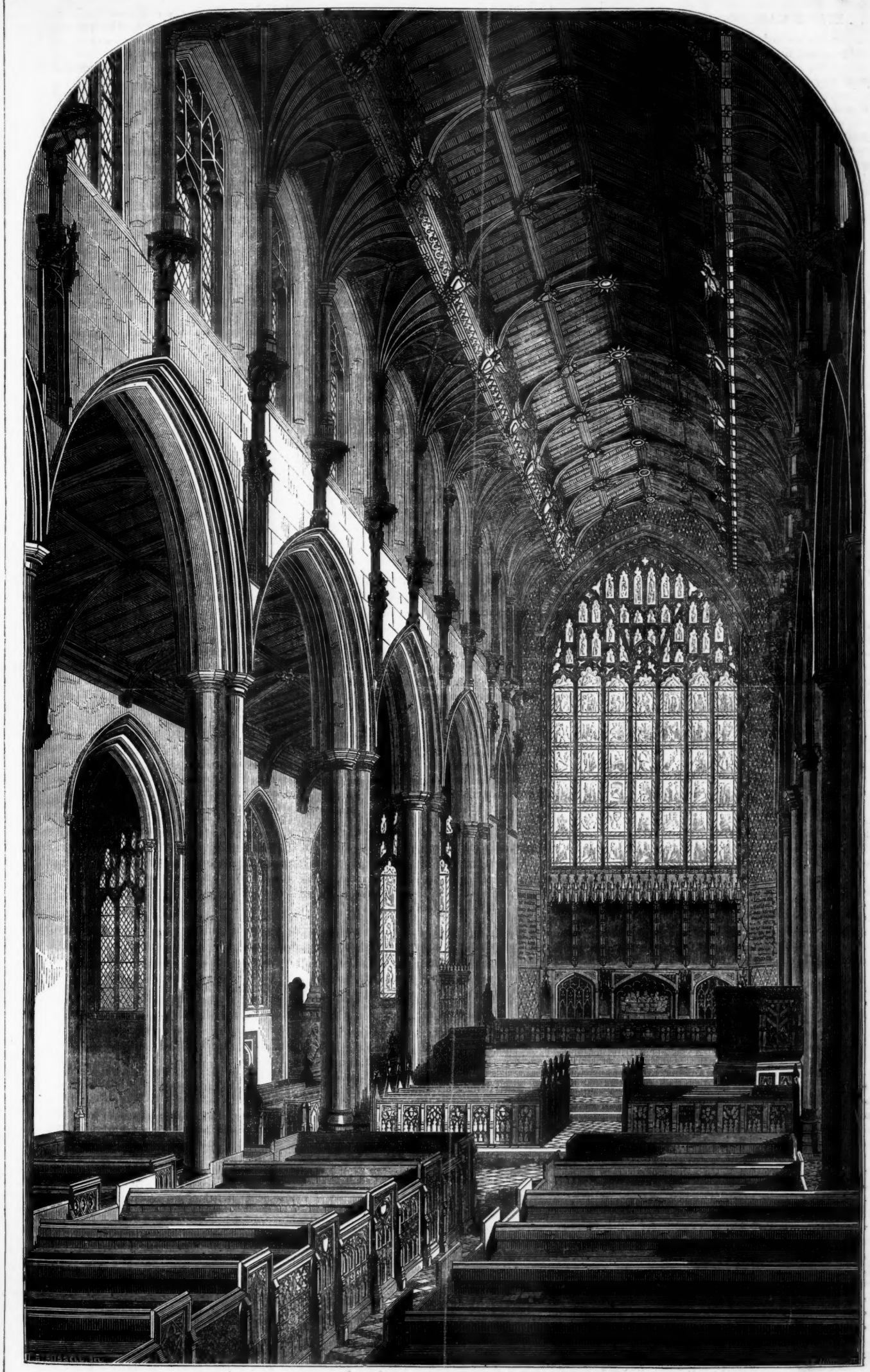
But that, considering the difficulties of the programme, the labour and study that it has necessitated, the talent of which many of the competitors have given proof, the jury have determined to award pecuniary indemnities of the several amounts of 100*l.* to the author of the first design, and 60*l.* each to the authors of the second and third designs, in the order of merit."

This report was adopted by the Belgian Government; and, although the matter has since been taken up by the Royal Institute of British Architects, no revocation of this unjust decision has yet been come to. That it is unjust, notwithstanding the special pleading of the Belgian Government, is evident. Article 5 of the Conditions says: "Prizes shall be awarded to the three designs which are considered the best *amongst* those which comply with the conditions of the programme." To say that none of the designs complied with the published conditions is an easy assertion that may be made, by an imaginary standard being set up by the judges, in every competition proposed, but will not be received as satisfactory by the public. We fully agree with the architects that "such an attempt at a paltry saving by the reduction of the premiums is a reflection on the honour and dignity of the Belgian Crown, as well as a breach of faith between the government of one nation and the citizens of another."

In a previous number (p. 333) we gave an external view of the Design by Messrs. Green & De Ville: and we now add the plan of the principal floor.



PREMIATED DESIGN FOR PROPOSED LAW COURTS, BRUSSELS.—*Ground Plan.*



ST. PETER'S, MANCROFT, NORWICH.——*As restored: Mr. R. M. Phipson, Architect.*

ST. PETER'S MANCROFT, NORWICH.

NEXT to the cathedral, St. Peter's Mancroft* is the largest and finest ecclesiastical building in Norwich; none of the other thirty-five churches which the city contains approaching it in its lofty and elegant proportions. Like many of the Norfolk churches, it is of the Perpendicular style. The old church was pulled down about the year 1430, and the present edifice was finished and consecrated in 1455.

The plan of the building is cruciform, the transepts being exceedingly small; in fact, little more than chapels; but in height they range with the aisles. There is no chancel arch; the separation between the chancel and the nave being by steps only. The eastern bay of the chancel is raised 4 feet above the level of the nave floor, and is reached by a flight of seven steps, which give a noble appearance to the altar table† Behind the latter is the original vestry, which is entered by two doors, one on each side the table. The roof of this chamber is a very excellent piece of Perpendicular work; and two circular staircases lead from it up corner turrets at the east end of the chancel. Below the vestry is another apartment of the same size, with a groined roof carrying the floor of the former. At the west end of the church is a very rich Perpendicular flint tower covered with panelling. The stone with which the latter is constructed is much decayed; and it is to be hoped that an effort will be made to repair and reinstate it before it is so far gone that its maintenance and accurate reproduction would be impossible. As this tower stands upon high ground, and nearly in the centre of the city, it is one of the most conspicuous features in the place; and it behoves the good citizens to take more than ordinary care of this, their metropolitan church.

The west door is deeply recessed with rich sculpture in large hollow mouldings. The battlement and pinnacles are gone; or, perhaps, they were never finished. The bottom of the tower forms a porch, with large open arches on the north and south sides. Its roof is groined, and there are some very curious and effectively-sculptured bosses at the intersections of the ribs. A view of the south side of this tower will be found in the second volume of Wickes's "Towers and Spires."

The clerestory has seventeen windows on each side, with good tracery, much of which has been lately restored. The roof of the nave and chancel is an exceedingly good specimen of fifteenth-century work. The wood groining which springs from shafts between the windows is somewhat rare in design, and produces a very elegant and light effect. Seven lofty arches divide the body of the church from the north and south aisles. The total inside length, exclusive of the tower, is 146 feet, and the extreme width 63 feet 7 inches, the nave being 23 feet 11 inches, and the north and south aisles 17 feet 3 inches and 17 feet 6 inches respectively. The height of the nave from the floor to the ridge is 56 feet. The tower is 32 feet square and 99 feet high.

With a shell so beautiful, although somewhat decayed, the whole church was filled until 1850 with high and cumbrous pewing, a very ugly gallery, a "three-decker" pulpit, reading-desk, &c., and a quantity of other woodwork of the Georgian period; to make room for which, the fine piers and other stonework had been much cut about and mutilated. In the year mentioned, the parishioners determined to sweep away the unsightly mass, and collected about 1,000*l.* for the purpose. Designs were advertised for, and those of Mr. R. M. Phipson were selected; but the cost of carrying out the restoration as he proposed amounted to between three and four times the subscribed sum; and much debating ensued as to whether the work should be done in a "plain way" with the money collected; or whether, as strongly urged by the architect, it should be executed in a manner worthy of the church, and piecemeal as funds permitted. The latter course was ultimately adopted; and from that time to this the restoration has been gradually going on; the altar-railing and the encaustic tiling within it having been executed some two or three months since. The whole of the benching is of oak, with elaborately-carved panelled ends, all varied in design. The bench-ends in the chancel have poppy-heads, but in the nave they are square. Some contain emblems, and others arms of persons connected with the parish. The prayer-desk and the upper part of the pulpit are of carved oak; the base of the latter being panelled stonework.

Open screens, not yet fixed, will divide the two eastern bays of the chancel from the chancel aisles; and the whole is paved with Minton's tiles, with the exception of the part within the altar-railing, which is laid with Maw's.

The principal portion of the work has been executed by Mr. Ringham, of Ipswich, under the architect's immediate superintendence. The outlay, up to the present time, has been between 2,000*l.* and 3,000*l.* Much, however, still remains to be done. The reredos shown in the view is at present only on paper. A west gallery, which contains the organ, still blocks up a very fine west arch, opening into the tower, and hides from view a handsome five-light window; and many other minor works require to be done to render the restoration complete. These things, however, will doubtless be gradually effected; and St. Peter's Mancroft will then be one of the handsomest churches of its date that can be found in the eastern counties.

It should be mentioned that there is, in the western bay of the south aisle, a curious Perpendicular bap'istery. It consists of a canopy supported by pillars on a raised platform, with room to walk round the font, and has on the upper part an inscription in black letter. It is mutilated, and the architect's intention is that it should be carefully restored. According to Parker, the one at Trunch (Norfolk), and an earlier one at Luton, in Bedfordshire, are the only other examples known in England. We would suggest careful maintenance and repair, and as little new work as possible. The tower contains a very fine peal of ten bells, the weight of the tenor being forty-two hundredweight.

* *Magna Crofta Castelli*, the great croft, or home-field of Norwich Castle, now the Market-place, which St. Peter's adjoins.

† St. Gregory's Norwich; St. Mary's, Worstead; and several other Norfolk churches, have their altar platforms similarly raised.

ON THE ARCHITECTURE OF INDIA.*

I MUST premise that the little attention which I have given to the architecture of India has been given as an artist, and not as an architect, and that the drawings which I have done are the rough materials for pictures, and not mathematically correct drawings done to a scale. I fear there is little that will be found altogether new among them, unless it may be among some of the details which I generally made out to enable me at any future period to enlarge the scale of my pictures; and often I was induced, from the great beauty of some of these ornamental details, to add them to my sketch-book with no other intention than that of preserving some rough remembrance of them. If I have little that is new; still, if I can convey to you but a faint notion of the great beauty of Indian architecture, and lead you, though but slightly, to recognize its high character, I will have done something to satisfy myself; for it may assist in leading others to add to our stock of knowledge concerning it. At present we have not got enough of material to explain everything connected with Indian architecture: more details are wanted by which to compare and trace the styles of the different periods; for the details are like the fossils in the rock,—it is by them that the date of a building is determined and the origin of its style traced. I am sorry that my own time, while in India, did not permit me to do more than I did. It was not for want of will; but the field is so wide, and distances are so great, that often my visits to celebrated spots barely gave me time to make but the roughest sketch, when I could have lingered for days and taken a pleasure in copying the ornaments which have been so lavishly bestowed on nearly every building in India. The great distance between this and India is being every day lessened, and more of our travellers are visiting India now than ever was before: this cannot fail to make the architecture of India better known; and I think that it has only to be known to rank with that of any other style. For myself, after nearly three years' travelling in India, and visiting almost all its celebrated buildings, my opinion—from its variety and its richness, and the great beauty of its ornament—is, that the architecture of India is unsurpassed.

Of all the buildings of India, by far the most interesting is that of the ancient Buddhist Tope, near Bilsah. I think all are agreed that this is the oldest building in India. It is a large round mass of building, now overgrown with grass and bushes. It is surrounded by a curious stone railing, with four gates through it. Colonel Cunningham has opened this tope, and written a most interesting account of it and the other topes in the neighbourhood, and thrown much light on the period in which it was erected, when the Buddhist religion was the dominant religion of India. Through his book we can see this solitary ruin repeopled with the monks of that ancient faith, in which, as some of the inscriptions describe it, "the land glittered with their yellow robes." According to Cunninghame, this tope is "106 feet in diameter; 42 feet high, springing from a plinth 14 feet high, with a projection 5½ feet from the base of the building, and a slope of 2½ feet. The apex of the dome was flattened into a terrace 34 feet in diameter. The base of the tope is surrounded by a massive colonnade 144½ feet from west to east in its diameter, and 151½ feet from north to south. This inclosure is therefore elliptical. By this arrangement a free passage is obtained round the southern staircase, and a greater breadth at foot of the ascent." He also "concludes that the tope itself was in existence in 443 B.C.; that the massive stone railing was erected in the reign of Asoka, between 260 and 250 B.C.; and that the gateways were erected in the reign of Sri Satakarna, between the years 37 and 19 B.C." The tope itself presents no architectural point worthy of remark; but the railing or colonnade, and the four gates, are certainly the most remarkable things in India. In the Greek, as in the Doric, for instance, we perceive the wooden features of its origin; but the construction is produced in that which is natural to stone: but in this case we have the wooden construction carried out in stone, in which the huge blocks are mortised into each other as if they were logs. The railing is about 10 feet high, and the posts or pillars are mortised into the rails of the tope, which are very heavy blocks of stone, each bridging over two of the pillars; and the cross pieces, which are elliptical in section, are also inserted at both ends into the pillars. In all the sculptures at Bilsah where buildings are represented, this peculiar railing is the most characteristic feature. From this, Colonel Cunninghame names it the "Buddhist railing," and nothing could be more fit by which to express it. On the gates there are numerous sculptures of topes, and they are all surrounded by this railing. Some have got a belt of it half way up the side, and the crown of the erection is always surmounted with this same railing. All the sculptures on the gates are surrounded and fenced with a border of the same, in which it assumes the position of an ornament, in which character it appears in all the oldest rock-cut caves of Buddhist origin; in fact, this ornament is enough in itself to establish the antiquity of a cave in India. In this I have not only described but indicated the origin of what I believe is about the earliest of all ornaments of which we have any remains in that country.

The gateways may be described as two pillars supporting a lintel of stone: mortised in the same manner as the railing on the top of the lintel are blocks supporting in a similar manner another lintel; and above that another set of blocks, and supporting a third lintel; the whole surmounted by emblems of the religion of Buddha. The capitals of these pillars are formed of elephants; and as specimens of art these capitals will stand beside any other of antiquity, either for originality of invention or artistic execution. To support the side projections of the lintels, there are curious brackets formed by female figures and elephants. In some cases where they have given way, you will see in the sketch the mortised holes by which they were held to the building. Each of these gates is covered all over with sculpture of every kind: there are topes with figures worshipping: from these we can make out clearly the true character of these topes: you will see them in my sketch in all cases with an umbrella, and in most cases three umbrellas, with garlands of flowers hanging to them. There are the emblems of Buddha, such as the wheel. There are battles and sieges, where men from houses and battlements are using bows and arrows against their foes, who are similarly armed below. There are great ceremonies represented, and domestic scenes of different kinds; and some of them so very truthful, that you will find the very same scenes going on in any village of India at the present day; showing how stationary the civilization of the East has been. They also show how little change has taken place in costume. I have sketched a figure who has the piece of cloth wrapped round his loins, which you may see all over India at the present day. I have also sketched a boat with a man being rowed along by other two men: in this the two pieces of wood forming the boat are clamped together exactly as you may see them on the Ganges at this moment; showing

* Read by Mr. William Simpson, at the Royal Institute of British Architects, as elsewhere mentioned.

that their "marine architecture" has not changed much for 2,000 years. In these spirit-rapping days, it may be interesting to know what these followers of Buddha thought of the beings of the other world. Into this also we have some insight; for I found what I take to be their idea of an angel: it is a human head and body, with the feet, tail, and wings of a peacock, which is a holy bird in India.* This figure is worshipping at a tope, from which we might infer that they believed there would be topes in the next world as well as this. I believe that these gates would throw more light upon the people of India than all the other buildings of the country put together. Two of these gates have tumbled down, and will soon decay among the rank vegetation of the place. I believe that money spent in bringing these gates to this country would be devoted to an object that would amply repay itself. As the place is a jungle, only the haunt of wild beasts, I cannot see what harm there would be in bringing home the whole four gates, if this could be accomplished. If it could be done, I venture to say that they would rank in value and interest with any ancient sculptures in our collections. The whole of the hill at this place is covered with ruins and fragments of sculpture. I have shown one sketch, an old lichen-covered temple, with a figure of Buddha in it. In this you will see how Buddha is almost always represented. He has a circular piece of ornament round his head, the exact counterpart of the nimbus represented round the saints by the early Christian painters. That sketch also gives a little of the older periods of ornamentation. There are two fragments on the ground, where the affected mannerism in the form of the figures indicates a more modern style. The sculptures on the four gates are perfectly free from this mannerism, which is one of the marked characters of Hindoo art.

There is another tope at Sarnath, near Benares, which dates about the sixth or seventh century. This tope is much higher in proportion to its breadth than the Bilsah Tope. All round its base is a mass of elaborate ornament. In every compartment the design is different, so that it might be looked upon as a kind of pattern-book of the ornament of the period. I believe that good photographs of the ornamental details of this tope would be invaluable; because, if I mistake not, there are no intermediate remains in this part of India between it and the Bilsah tope; on the latter of which, with the exception of the "Buddhist railing" and a small running scroll, there is no ornament: it is all figures and emblems. At Sarnath, on the contrary, there are no figures, but a high development of ornament; and it might be taken as exhibiting the result of 600 years' progress; and, besides indicating what had been accomplished, it would no doubt assist us in giving links by which to trace out the more modern styles.

There is only one other tope in the Punjab which I wish to refer to, but I will speak of it with the architecture of Cashmere.

The next point I will refer to is that of the rock-cut temples of Western India. I did not visit the whole of these; but I saw the most important, such as Elephanta, Karli, Ajunta, and Ellora. I will not attempt to give you a detailed account of these wonderful places: that has been sufficiently done already. The Buddhist caves, which are the oldest, are of two kinds;—the Vihara caves, and the Chaitya caves. The Vihara caves are generally square apartments, with cells all round, in which the monks lived, with a recess at the back, in which a figure of Buddha is placed. From what I saw of the ceremonies of the Buddhist religion in Ladak, where it still exists, I can easily fancy these caves filled with the monks, and the whole place "glittering with their yellow robes." They were ascetics, and begged their food, which they never partook of until after mid-day; and their whole time was employed in prayers and ceremonies prescribed by their creed. It was in this asceticism that these caves had their origin. The Buddhist ascetic lived in the woods and among the rocks like hermits. Some one, no doubt, began to add to the size of his quarters in some hole in the rock; and some spot would, no doubt, acquire a character for superior sanctity; and, becoming celebrated, regular excavations were commenced; and thus we have places like small towns all dug out of the solid rock, and in some instances decorated with almost an excess of figures and ornament. Here, again, we have the wooden features of the style carried out to almost an absurd pitch of imitation. In the Karli cave, beams of real wood are constructed all over the roof, so as to realize the perfect resemblance of the wood temples to which they had been accustomed. And, strange to say, that although this is the oldest of all these caves, being about 1,800 years old, these beams still exist, and are about as perfect as on the day they were first put up. In all the old caves we have the "Buddhist railing" as the principal ornament. It forms a kind of frieze over the outside of the great cave at Karli, besides being introduced in belts once or twice farther down. It goes all round the dagopa in the interior, and is on the tee on the top of the dagopa. I have also shown a slight sketch of the oldest Vihara cave at Ajunta, where you will see that this Buddhist railing is the great feature of the place. But there is another feature of these caves which I must describe, as it will explain a great deal of the architecture of that early period. This is seen in the Chaitya caves, which are the real temples or cathedrals of the Buddhists. You will see in the sketches that there is over the door a large circular opening, which is the only window to the place. This gives us what is supposed to be quite foreign to Indian architecture, namely, the arch; yet it is not an arch in principle: it is only a circular-topped opening; and, in the original manner of the period, had been formed of wood. In the sketches you will see the wooden beams all round the circle represented in the rock. The peculiar form given to the outside of this opening or window gives the origin to a vast mass of the decoration and architectural features of not only the rock-cut caves, but of all the southern architecture of India. It is like the pediment of Classic architecture: it covers all doors and windows, and it is introduced where there are neither doors nor windows. You will find it all over the front of the Karli cave; and it is repeated over the Chaitya cave at Ajunta: there you will see it introduced as an ornamentation along the mouldings: in fact, you will find this horseshoe-like ornament among the old temples all over India; and there is one style (but I have no illustrations of it) which is, if I remember it right, a mass of deeply-cut figures, in which this horseshoe figure is the main feature, repeated all over.

In the sketch of the Chaitya cave at Ajunta you will see that it is most elaborately sculptured, and that there are figures of Buddha of various sizes, both sitting and standing. What is called the *dagopa* in these cases is identical with the round-built Tope of Bilsah: here it is surmounted by the usual three umbrellas, and has got a figure of Buddha himself on the outside. The ribs of the roof of this cave at Ajunta are cut out of the stone in exact imitation of the wooden ones. As this is one of the later caves, you will see that the "Buddhist railing" ornament is superseded by a much more developed style of ornament. The pillars are, I think, very beautiful in design: some were plain, some fluted, and in some the flutes went in a spiral form. I have drawn one of these by itself. You will see it has a bold, massive, bracket-like capital, in which a figure of Buddha sits; and the bracket part of it is filled with figures, in fine bold action. If we had casts here of the capitals of this cave, with that of the elephant capitals of Karli and the Bilsah Tope, I think they would be enough in themselves, from their originality and graphic execution, to place Buddhist art in the very highest rank. My own opinion is that it has more of the spirit of Gothic art about it than any other style I know of. I think I may freely assert that it is less conventional than any other Eastern style. I have drawn on the same sheet as the pillar of this Ajunta cave a small bit of the ornament a little larger, as I think it gives the origin of a large amount of later decoration: it is a small festoon, with a series of square forms all along it which are so like Indian jewelry that I think any one who is acquainted with the way stones are set in that country will at once recognize the resemblance. On the same pillar there are other ornaments which I think have had the same origin; and you can easily imagine, at the period when these temples were formed of wood, how the devotees might in their enthusiasm pin on the pillars, as offerings to God, the ornaments of their persons; and how these ornaments have thus formed the style of the more permanent material in which we find them. I will show you, as I go on, other illustrations of this origin: at present in Ladak jewels are introduced into the architecture of their altars at the present day; and it is the same with the Hindoos: their temples and idols are in some instances covered with jewels. There is one god so rich in jewelry, that jewelers are not admitted into his presence: this custom is owing to his having been "garrotted" by one of that fraternity on a former occasion. All these Buddhist caves were plastered and painted over with a vast variety of subjects, and that too in a marvellously good style of art for that period. I question if better specimens of art could be found in any other part of the world at that time: certainly India has never produced anything like them since. Indian painting is at all times innocent of anything like perspective, or light and shade; but these old Buddhists have left us illustrations that they had some notion of both. The foreshortening of the figure is here common, of which a native artist of the present day has no conception. As the colours in which these caves are painted are in the most cases still bright, it would be important to know what they were composed of. I often saw patches of a bright blue, still in a good state of preservation, and am inclined to think that ultramarine must have been used. I was led to think so from having learned that that was the colour always used in India for decoration and every kind of painting until lately, when it has been superseded by the cheapness of the common French ultramarine. This change only occurred a few years back; and I found one man who used the ultramarine, and made it himself from the lapis lazuli. I also found that the box-painters of Cashmere used ultramarine, which they made themselves from the small fragments got from the lapidaries; but now the French ultramarine has taken its place even in that far-away region. The most of the painters there told me that they had made the ultramarine themselves but a few years back. The fact that it was used at all is to me a strong presumptive evidence that it was used in the painting of these caves, for we know that it was known in the East in the very earliest times.

As the wooden origin of Indian architecture is so apparent, it would be most interesting if we could realize to ourselves the appearance of those wooden structures of that early period. Few of the stone buildings of even much later times remain. Whole cities have sprung into existence, and disappeared in India, since the wooden types of the Buddhist architecture existed. Of their interior appearance we can make out from the rock-cut caves the most minute details; and, had we the same data for their exteriors, a builder of the present day could make out an estimate to a fraction of what they would cost. Although the material is scant, yet I think enough can be found from which to form a very fair idea of their general appearance. The front of the rock-cut caves gives us, at least, one end of these primitive buildings; and, in giving this, it suggests part of the rest of the construction. At Karli, the outer doorposts are given, and the projecting ends of some beams are represented. At the Carpenters' Cave, in the Ellora group, if I remember right, there is the end of a projecting beam shown, and the outside pin to hold it in its place is most faithfully given in the stone; but whatever was awanting, I think, could be found in the sculptures of the Bilsah Tope. I think the minutest details even could be supplied from the ample resources of these sculptures. In Colonel Cunninghame's work there is a house copied from these, and I have slightly enlarged it; and, as it agrees with all our other knowledge, I think it may be accepted as a fair representation of a house of that period. It seems to be a house with three floors. In it you have the Buddhist railing,—not, I think, as an ornament, but as a constructive balcony; and the upper-floor windows are of the horseshoe form of the Chaitya Cave. I should also expect that the end of this house ought to have the same character in the roof. In this drawing from the Bilsah Tope, I think we have the origin of nearly every feature of the Tamul or Southern Indian architecture. I am not well acquainted with the details of southern buildings, but the general character is exactly what this drawing represents, only that they are much more elaborately ornamented. The gateways to the temples of the south will serve to illustrate this. Their upper portion is the same as the highest story. In this Buddhist residence each end has got the *horseshoe* form as a sort of gable, and smaller horseshoes all round, by way of ornament. Then comes a row of low pillars, or pilasters, like the posts forming the supports in the middle story of the drawing; and the almost verandah-like architrave, rounded at the top, as in this old sculpture, is one of the main features of Southern Hindoo building, and it is generally ornamented with the

* The peacock was held sacred by the Romans, too, as the "winged glory," on the back of which the Cæsars were wafted to the gods. It was also Juno's emblem. The honour in which the peacock's feather is held in China, too, should not be overlooked. It is there a symbol of high distinction.—ED.

horseshoe pattern. These short pillars and architraves are repeated downwards, according to the size of the building, and you have a rough description of Tamul architecture. A minute study of southern buildings would, no doubt, reflect back again some light on this old Buddhist style.

Of the Brahminical caves at Ellora and Elephanta I have little to say. The Kylas is certainly a marvel of work. It is less known to the western world than the Pyramids; but I think that the Kylas of Ellora is far more wonderful than those mountains of labour on the Nile. I am here speaking of them as mere labour. As works of art, I found little to sympathize with in comparison to the old Buddhist work; yet there is good stuff about them, too. I have shown an elephant carved out of the solid rock in the inclosure of the Kylas: it is full size, and about as perfect a representation of that animal as I have ever seen. I also show the Lanka Cave, which is in the scarp of the rock at the Kylas; and I think it is justly considered about the best of the Brahminical caves for its sculptures, figures, and ornament. There is much that is different in this cave from the usual building styles, and yet a great many of the Southern Hindoo details are to be found.*

THE COVENTRY BOARD OF HEALTH AND "THE BUILDER."

AT a meeting of the City Council, acting as the Coventry Local Board of Health, Mr H. Soden inquired of the Inspector of Nuisances whether there was any truth in the statements made in the *Builder* in reference to the unsatisfactory state in which many parts of the city were said to be?

The Inspector said he had read the article, and there was much stated that was untrue [of course].

Mr. Bell said he believed, also, that there was a great deal that was too true.

The Mayor was brave enough to assert, that though there was no doubt in the world but that there were filthy places to be found in Coventry; with respect to the bulk of the statements made by the writer in the *Builder*, they were utterly without foundation. We shall see.

Dr. Goate said he could show any member of the Board an inhabited house in Cook-street that was not fit for any human being to live in; and that was only one instance out of a number which could be pointed out. The *Builder* was quite correct in the statement it made with reference to the feeding of pigs in Palmer-lane.

Mr. Hickling said, notwithstanding all the exceptions which might be made to the statements of the writer in the *Builder*, there was some truth in them; and it was the duty of the Board to call upon the Inspector to carefully visit White Friars'-lane and every other place where such nuisances as those complained of existed, and report upon them to the Board.

On the motion of Mr. Soden, the Inspector was ordered to examine all those places mentioned in the *Builder* where nuisances were said to exist, and report upon them at the next meeting of the Board. One good result, at any rate.

THE FLOOD IN THE MIDDLE LEVEL.

THERE is nothing very satisfactory as yet to record, unless it be that the extent of country flooded is now said to have been exaggerated, as well as the amount of loss; but while the *Morning Post* of Saturday last estimates the land covered at 8,000 to 10,000 acres, and the damage at 200,000*l.*; the *Times* of Monday says:—"It is not extreme to say that 80,000 to 100,000 acres are now lying in a perilous situation, completely at the mercy of the skies during the next two months, and with a doubtful prospect for the winter. If one-fifth be pasture, the amount of tenants' capital alone, reckoning arable at 8*l.* per acre, and grass at 16*l.*, is very close upon a million sterling." The *Morning Post* of Tuesday says:—"Fortunately, the promptitude which has been manifested to stop the hole in the east bank, which had been scoured 20 feet deep and 40 feet long, has rendered the effort successful; and happily (for the present at least) averted such a catastrophe as the deluging of the whole of the country on the Downham side of the cut. The coffer-dam is progressing very nicely—all the piles being connected together as fast as they are driven with iron bolts, by an expert diver, who stays at the bottom of the cut for three quarters of an hour at a time. It is felt to be a most unfortunate thing that Mr. Müller is not permitted to go on with the earth-dam, as the piling is liable to be carried away so soon as it is exposed to any force of the tide; and should it give way, there will be no obstacle again to the free course of the spring tides. Within a few yards of the outfall of the middle level sluice, and emptying into the same channel, the river Ouse, is the outfall of two other cuts for the purposes of drainage. These sluices are known by the names of Marshland Fen and Smeeth Sluice, and Marshland Sluice. An inspection the other day disclosed the fact that the former of these, owing to the extensive quantity of water pouring through the drains, was being undermined exactly in the same way as was the middle level sluice. The discovery was no sooner made than workmen were employed to avert this calamity, and piles are being driven, and other means resorted to, to preserve these barriers. If they were unfortunately to be destroyed, the tidal waters would have two other places for ingress, and the deluge would extend to undefined limits. It is to be hoped, however, that the energetic measures adopted by the Marsh Land Commissioners and their engineer, Mr. A. Sanders, C.E., will prevent such a direresult."

Our own correspondents agree in saying that the damage has been much overstated. The coffer-dam now being constructed will, it is hoped, be the means of preventing the ingress of the tidal waters; but, unfortunately, this cannot be completed before another series of spring tides will have occurred, the effect of which is much dreaded. Other outlet sluices into the Ouse, in the immediate neighbourhood, are found to be in a nearly similar state, and measures are being taken to prevent a repetition of the disaster.

The subject of the inundations on the east coast was brought under the notice of the House of Commons by Mr. Bentinck, who asked Mr. Fellowes what had been done. That gentleman entered into a long explanation, the effect of which was that the repairing of the works where they had been broken through by the tide had been confided to Mr. Hawkshaw, to be effected without regard to expense.

* To be continued.

THE ARCHITECTURAL ASSOCIATION.

THE ordinary meeting of members was held on Friday evening, the 23rd inst., at the House in Conduit-street. Mr. Blashill, V.P., occupied the chair.

Mr. Henry L. Florence, of Brixton-place, Brixton-road, was, on ballot, elected a member of the association.

In the absence of Mr. G. B. New, who was to have read a paper on Roofs, Mr. R. P. Spiers read a paper entitled "A Sketching Tour in Normandy in the year 1861."

At the conclusion, the Chairman observed that they were much indebted to Mr. Spiers for having at very short notice read a very interesting paper. He had seen most of the places referred to in the paper; and he could speak to the fidelity with which Mr. Spiers had described them. He ventured to suggest that architectural students, when prosecuting their researches, should make notes as to the best hotels, as regards charges and accommodation.

A vote of thanks was passed to Mr. Spiers for his paper.

THE ARCHITECTURAL PUBLICATION SOCIETY.

THE annual meeting of the members of this Association was held on Monday evening last, at the Rooms of the Royal Institute of British Architects in Conduit-street.

Mr. Ashpitel presided.

Mr. Cates, hon. secretary, read the report of the committee, of which the following is the material portion:—

"The Illustrations to be issued for 1861 have, for a long time, been prepared; and would have been issued prior to this meeting, had not the claims of important matters connected with the International Exhibition diverted the attention of one of the lithographers from his engagements with the Society; thus delaying the completion of the part: nearly all the plates are now printed; and, therefore, the part will soon be ready for distribution.

It will contain the following plates: Farm-Buildings—Fountain—Groined Roof (2)—Half-Timber House—Lych Gate—Metal Work (2)—Mosque—Pavements, coloured (2)—Pavements, in outline (2)—Porch.

The subjects comprised in these fourteen plates have been selected from the portfolios of Messrs. Bowman, R. S. Burn, F. P. Cockerell, J. T. Christopher, G. Goldie, O. Hansard, R. J. Johnson, T. S. Pope, J. P. Sedden, G. Truefitt, and J. W. Walton, who have kindly placed their valuable collections at the disposal of the committee. To all these gentlemen the thanks of the Society are due, but more especially to Mr. Henry Bowman, of Manchester, for the liberal manner in which he has permitted a selection to be made from his important and unrivalled series of measured drawings of the marble pavements of St. Mark's, at Venice: from this valuable source the committee have secured materials for the two coloured plates, and have themselves to express their obligations to Mr. Bowman for his kindness in materially assisting them, not only in the arrangement and reduction of the examples for, but also in superintending the execution of, the plates, so as to secure the proper colours in printing.

These subjects, from their well-known value, have appeared to the committee sufficiently important to warrant them in expending a larger amount than usual, by adding to the twelve plates ordinarily issued, uncoloured impressions of these designs, showing at a glance the key to their formation; and thus being likely to prove serviceable to the designers of similar works.

To the last part issued there was prefixed a list of terms, proposed for insertion in the next part of *letter-press*, and contributions and suggestions were invited from their friends who might have notes on the various subjects. The committee hope that the subscribers will evince their interest in the work by communicating any information they may possess; and the labours of the writers will be thus materially assisted, and the 'Dictionary,' at the same time, usefully increased.

A suggestion which lately appeared in one of the architectural journals, that the back stock should be sold at a *reduced* price to provide funds for the completion of the undertaking, has afforded the committee an opportunity of publicly renewing their pledge, that no portion of the works of the society shall be sold under the subscription price; and the continued accession of new subscribers convinces the committee that the course they have taken is approved, and that it is the only one by which the society could be maintained in a sound and satisfactory condition.

The arrangements, which were commenced in 1860, and by which new subscribers were permitted to spread their subscriptions for past years over a considerable period, continue to receive general approval; and it is with much gratification that the announcement is made of *forty-two* members having availed themselves of this arrangement."

"The balance-sheets appended to this report show the receipt and expenditure on the several accounts; and that the balance applicable for completing the issue for 1860 is 207*l.* 18s., and for 1861, 279*l.* 15s. 6d.; the total balance in hand being 577*l.* 8s. 9d.

After a careful review of the position of their work, and of other similar undertakings, the committee are fully convinced that, notwithstanding the delays, they are comparatively but little in arrear; and whilst they fully sympathize with their fellow-subscribers in the anxiety that all must feel to reach the termination of their labour, they entertain a deep conviction that it is their duty, as well as the true interest of the society, to study far more anxiously how to sustain the excellence of the work, than how to hasten it towards an unsatisfactory conclusion."

The Chairman, in moving the adoption of the report, observed that, although the work appeared to be a little in arrear, still they must remember that punctuality could not in all cases be depended upon when the services rendered were altogether gratuitous. In order to ensure accuracy, it was absolutely necessary to give an author full time, unless, indeed, he were to disregard originality, and hash up the *disjecta membra* of other writers. The Great Exhibition had also seriously interfered with the progress of the Dictionary, as it had engrossed all their engravers and printers. He was very glad to find that the committee had resolved not to sell any portion of their stock at less than the subscription prices, because he was persuaded that, by adhering to their original resolution, they would in the end maintain the true value of their publication.

Mr. Burnell seconded the motion for the adoption of the report.

Professor Donaldson said there could be no doubt as to the popularity of the work, as the subscriptions for 1861 had been paid in advance, although but a portion of the work for 1860 had been delivered. At the same time, if they could get on a little quicker, it would be very desirable. The work had been in hand about nine years, and but a fourth of it was completed.

The Chairman said Mr. Digby Wyatt had estimated that nearly one half of the Dictionary was completed. In the case of the "Encyclopædia Britannica," the letter G was half way through the work.

Professor Donaldson suggested that perhaps some of the collateral subjects might be reduced, inasmuch as architects were necessarily obliged to accept a great deal of science as fact. He also suggested that it was quite unnecessary to introduce the names of unknown persons, as clerks of works, &c. He feared that, unless the work was condensed a little, it would not be completed for many years, or at a less cost than twenty guineas.

Mr. Burnell quite agreed in the view taken by Professor Donaldson, but urged that the matter was one entirely for the committee. With reference to scientific articles, architecture was quite as much of a science as an art; and no man could be a good architect who did not make himself acquainted with the general principles of science. With regard to scientific or collateral articles, he had himself contributed one on galvanism, for instance, which he had endeavoured to condense as highly as possible; but which he felt was a subject of great importance in connection with construction. He did not think it would be wise to cut the scientific articles too short; but he was of opinion that the committee should adjudicate upon the matter, upon some definite principle.

Mr. Jennings thought that everything should

be done to make the work popular; and that it should be architectural and not scientific.

Mr. Horace Jones suggested that many scientific articles might be transferred from other books and printed in smaller type.

Some further discussion ensued, after which the motion was put and carried unanimously.

Mr. Burnell then moved, and Professor Donaldson seconded, a resolution, "That the committee be requested to consider and adopt the best mode of condensing the articles connected with the sciences and subjects collateral to architecture, with a view to accelerating the completion of the Dictionary."

The motion having been carried, a series of resolutions were submitted, and agreed to; thanking the committee, honorary treasurer, honorary secretaries (Messrs. Wyatt Papworth, and Arthur Cates), and the other officers of the society, for their services during the past year, and requesting them to continue in their offices.

A vote of thanks was also passed to the local secretaries, to Mr. John Papworth, and to Mr. Hansard, for the zeal and energy which they had exhibited in promoting the interests of the society.

THE METROPOLITAN PRISONS.

SEVERAL of the old prisons which figure in an important way in the pages of the history of London have, even within a comparatively recent period, been disused and demolished. Without enumerating those which have been removed at an older date, we may mention the names of the Marshalsea, the Fleet, and the Giltspur-street Compter, which have been last removed; and soon the celebrated "Bench"—the "Queen's Prison"—will be also among the matters of the past. The state-prison at the Tower has been long unoccupied by traitors or conspirators; and the Serjeant-at-Arms is but seldom called upon to take into custody unruly members of Parliament. The Star-Chamber Court, the Palace Court, and other notorious institutions of the ancient times, have been abolished; and now new and more enlightened laws in connection with the confinement of debtors have caused the Whitecross-street Prison to be almost unoccupied, and rendered the Queen's Prison in Southwark no longer necessary. In consequence, Mr. Waddington has written to the Lord Mayor to say that the Government is of opinion that the prison in Whitecross-street will now be sufficient for the confinement of all the debtors of London and Middlesex, and proposes to bring a bill into Parliament for the abolition of the Queen's Prison, and asks the Lord Mayor what equivalent would be required by the Corporation for the use of a portion of the Whitecross-street premises. We may therefore, ere long, look for the demolition of the "Bench," which has for so many years been known by name familiar; and which is connected with several curious literary, artistic, and other associations.

As regards ventilation and some other sanitary arrangements, the prison in Whitecross-street is far less cared for than any of those appropriated to the use of felons. In changes which may be made this neglect should be carefully remedied.

ARTIFICIAL STONE.

"QUITE a new impulse" must now be given "to the external decoration of buildings," according to Dr. Frankland, F.R.S., in consequence of a discovery made and patented by Mr. Frederick Ransome, of Ipswich, in connexion with his well-known artificial stone, produced from water-glass and lime, with clay. Heretofore this artificial stone, after its formation in a plastic state, required about one month to dry, and another to be kiln-burnt. Now, it seems, the plasticity is superseded by stony hardness, not only without either drying or kiln-burning, but also in an hour or two's time! The moulded or prepared stone requires simply to be dipped into a solution, and the work is done, even when the stone has been one weighing a whole ton weight or more. The solution consists of chloride of calcium; or, as it is more properly called when dissolved in water, muriate of lime. When the moulded matter is dipped into this solution it is very soon saturated with it, and a double decomposition takes place: the lime combines with the silica, forming a silicate of lime, which is one of the two chief cementing materials in all our cements, mortars, and concretes (carbonic acid being the other): the muriatic acid combines with the soda of the water-glass, forming common salt, which is said to be "washed off." How this can be, however, we do not see clearly: it must pervade the whole substance of the new-made stone; and might certainly be rapidly extracted by boiling water, or more slowly by cold water, or by rain *in situ*, leaving the stone more porous than before; but we do not mean to insinuate that hence the new-made stone cannot be a permanent and really stony product. Indeed, Dr. Frankland's experiments with it seem to show that it must at once possess remarkably weather-resisting powers. On this point he says, keeping in view the result of his experiments, "I should scarcely have imagined it possible that an artificial material could in so short a time, and without any application of heat, have attained such weather-resisting powers." It was found, however, as was to be expected, that the stone experimented on *contained* chloride of sodium; so that this salt had not been "washed off;" but it seems to be extractable without injury to the tenacity of the stone, although with an increase of porosity, as Dr. Frankland remarks. Of the general results of his experiments, Dr. Frankland says:—"Whilst they point out the Portland, Whitby, Hare Hill, and Park Springs, as the natural stones best adapted to withstand the influences of town atmospheres, they also indicate that Ransome's patent concrete will be found equal to the best of these in its power of resisting atmospheric degradation; and, if the newness of Ransome's stone (the specimen experimented upon not having been made a fortnight) be taken into consideration, together with the well-known fact that its binding material, silicate of lime, becomes harder and more crystalline by age, I am induced to hope that Mr. Ransome has invented a material which, with the exception of the primary rocks, is better capable of giving permanency to external architectural decorations than any stone hitherto used."

THE IPSWICH SURVEYORSHIP.

THERE were forty-eight applications for the office of surveyor and inspector of nuisances to the local Board of Health, among whom only one belonged to Ipswich, namely, Mr. William Ribbans, who, after a discussion which, in the council, was characterized as a mere farce, was elected by a majority of 18, to 5 for the only other candidate who came forward out of six finally selected by the committee, but who had all been told that, though they were selected for final choice, the committee had determined (in mercy, we presume; considering the foregone hopelessness of their prospects) not to pay any one of them travelling expenses. Thus forty-eight gentlemen, in various parts of the country, have been deliberately befooled by a committee who, while advertising for them as candidates, never had the least intention of giving any of them, excepting one, the slightest chance of election.

INAUGURATION OF THE BUNYAN MEMORIAL.

THE inauguration of the new monument erected by subscription over the grave of John Bunyan, in Bunhill Fields Burial-ground, City-road, took place on Wednesday last, under the auspices of the Earl of Shaftesbury. It is gratifying to us to note the completion of a work which we have so often urged. The length of the tomb is about 7 feet, and the height rather over 4 feet. On the north side is a carved stone panel, on which Christian is represented as starting on his journey, with the burden on his back; while on the south side he is represented as in the act of reaching the cross, and the burden falling from his shoulders. On the top of the tomb is a carved stone effigy of Bunyan, in a reclining posture, with book in hand, his head resting on a pillow. At the east end of the memorial is a slab, formed of a portion of the old tomb, on which are engraved the following words: "John Bunyan, author of 'The Pilgrim's Progress.'—Ob. August 31, 1688, Æ. 60." The slab at the opposite end records the fact of the erection of the work by public subscription, under the presidency of the Earl of Shaftesbury, May, 1862. The profiles of the mouldings and tomb itself are not very satisfactory. There are other graves at Bunhill Fields to which we have before pointed attention as deserving of similar tokens of respect and appreciation.

SOLUBLE GLASS.—Mix ten parts of carbonate of potash, fifteen parts of powdered quartz, and one part of charcoal. Fuse well together. The mass is soluble in four or five parts of boiling water, and the filtered solution, evaporated to dryness, yields a transparent glass permanent in the air.—*Chemical News.*

CHURCH-BUILDING NEWS.

Holt (*Norfolk*).—A Methodist Free Church is about to be built at Holt, from a design by Mr. Jeckyll, of Norwich, in the Pointed style. It is faced with black flints (split). The two vestries, with an orchestra above them, form the front, with a turret about 70 feet high. There is also a gallery at the opposite end of the nave for the school children. The benches are made of red deal, varnished. Accommodation is provided for 400 adults and 100 children. The lowest tender was 1,706*l.*

Hathern (*Leicestershire*).—The church here, erected about the thirteenth century, has of late years been much neglected, the whole of the structure having been allowed to fall into an almost dilapidated condition. Originally this church contained many interesting features of the Decorated period, as one or two windows that have escaped destruction, and the nave arcade, show. From the fragments that have been found there appears to have been an earlier structure. From the very dilapidated condition of the aisle walls, it was found necessary to take them down, as also the clerestory, allowing the nave arcade to remain; and in rebuilding great care has been taken in introducing any new feature that it should be in harmony with the existing structure; and such parts that would permit of it have simply been restored. At the east end of the north aisle a chapel has been erected to the memory of the late rector, the Rev. E. T. Phillips, having a tomb placed externally in the wall under the window. The whole of the interior has been fitted up with benches of pitch pine corresponding in design to an original one found in the church. The pulpit is of stone, having marble columns at each angle, and medallions on each face. The chancel has oak stalls and stone reredos. The floors are laid throughout with tiles in pattern, the chancel having encaustic tiles, the whole made by Whitstone, of Coalville, Leicestershire. The whole of the works have been carried out from the designs and under the superintendence of Mr. Joseph Mitchell, architect; and have been satisfactorily completed by the contractor, Mr. Thomas Garland, of Nottingham.

Willenhall.—A new Baptist chapel and schools have been commenced here. The site chosen is Lichfield-street, where the buildings are being put up by Mr. David Evans, of Wolverhampton, builder, from plans by Mr. Manton, of the same town, architect. The chapel will accommodate 556 persons; the schools 300 pupils; and the cost of the whole will be 1,600*l.*

Cardiff.—The following tenders for the completion of St. Andrew's Church, in Windsor-place, were received: Webb, 2,350*l.*; Stride, 2,160*l.*; D. Jones, 2,495*l.*; W. John & Son, 2,470*l.*; W. Mitchelmore, 2,436*l.*; T. Waller, 2,500*l.*; T. Williams, 2,334*l.*; James & Price (accepted), 2,254*l.* By the terms of agreement entered into with the contractors, the church, which was begun some time ago, is to be completed by the 30th of November next.

Frankby.—The church which has been erected at Frankby, Cheshire, has been consecrated. The cost of the church and parsonage is upwards of 4,000*l.*; and when this is paid off it is contemplated to erect suitable schools. The church, dedicated to St. John the Divine, is in the Early Decorated style of architecture. It consists of a chancel, with organ choir and vestry; a nave, divided from the north aisle by an arcade of three bays; with a south porch. The chancel is 28 feet long by 20 feet wide; the nave, 48 feet by 27 feet; and the north aisle the same length by 14 feet wide. The nave is lighted with double sunk windows on the south side; the aisle with two-light lancet windows on the north. The west gable is pierced with two long single lights, which are intended to be filled with stained glass. The chancel east window has three lights, with stone-work tracery. It is filled with stained glass, in several divisions, each representing a separate subject, and *in memoriam* of Mrs. Anna Selina Congreve, the mother of the incumbent. In the vestry there is a two-light window filled with stained glass, as are the two small south windows in the chancel. The roof is constructed with principals of laminated timber, supporting rafters open to the ridge. The chancel roof is boarded and divided into panels with moulded ribs, all resting upon a moulded and carved cornice. The whole of the chancel is laid with tesselated pavement. Open seats, there being no closed pews, fill the whole of the nave and north aisle: there is accommodation for about 350 persons; and upwards of 150 of the seats are free. Exteriorly at the junction of the nave and chancel is a bell

turret. Right and left on entering the porch, there is a small stained-glass window. The parsonage-house is an example of a modified application of the Early Decorated style. Messrs. W. & J. Hay, of Liverpool, were the architects; Mr. Thomas, of Oxton, was the contractor; and Mr. Jos. Pepper, clerk of the works. The carving throughout the church has been done by Mr. Stirling, of Liverpool.

BUILDING NOTES, IRELAND.

EXTENSIVE wings, about 28 feet wide by 50 feet long, are in course of erection in connection with the Ursuline Convent, Sligo. The new wings will contain school-rooms and dormitories: there will be also a new passage from them to the chapel. Mr. Killgallen is the contractor; Mr. Goldie, architect; the amount of contract, about 2,000*l.*

A new District Model School is in course of erection at Sligo. It occupies about one acre of ground at the west end of the town. The walls externally are built of limestone, and the dressings to the front windows, quoins, strings, &c., are of Mountcharles sandstone from the co. Donegal. The buildings consist of a centre block and two wings. A corridor runs at the rear of the centre buildings, and has doors opening off it to the kitchen apartments on the east, to the yards in the centre, and to the boys' school and class-rooms on the west. The girls' school-room is situate at the north-west angle of the building, and has a class-room opening off it, 18 feet by 16 feet. The centre block of building is occupied by a principal entrance, inspector's office, study for pupil-teachers, and class-rooms. The west wing is occupied by the infant school, and has a small entrance-porch at the west side. The east wing contains master's apartments, including sitting-room, bed-rooms, and private offices. The dimensions of some of the principal apartments are as follows:—Boys' school, 60 feet by 30 feet, and 20 feet high from floor to wall-plate; girls school-room, 35 feet by 21 feet; infant school-room, 30 feet by 20 feet. The entire frontage is 150 feet 7 inches, and depth 125 feet 2 inches. The front is of Italian character: the windows are circular-headed and deeply recessed, with moulded jambs: there is a heavy eave-course round the building supported by cantilever blocks. The contractor is Mr. P. Keighron. Mr. J. H. Owen is the architect; Mr. Edward Brannick, clerk of works. The buildings, when completed, will cost about 7,000*l.*

A new Town Hall is in course of erection at Bandon, co. Cork. It is building out of a fund created for the purpose by the townspeople. The new building will contain a reading-room, 80 feet by 40 feet; library, 30 feet by 18 feet, and suitable closets, &c., &c. There will be a handsome portico in front, of the Grecian-Doric order. The rooms are lighted by circular-headed windows, with dressings of Italian character. The builder is Mr. James Hunter, of Bandon; the architect, Mr. Brash, of Cork; the amount of contract about 1,500*l.*

THE NUISANCE OF OUT-BUILDINGS.

DO use your great circulation to put down an increasing evil and nuisance. I mean the annoyance caused by neighbours building poultry-houses close to dwelling-houses, and open only at the top; the noise ascending utterly preventing sleep after daybreak.

In one case the poultry-house is within six feet of the bed-rooms; and although repeated complaints have been made, yet still the annoyance continues. The remedy, I am told, is by indictment; but few like to do this with a neighbour, as it is sure to produce endless strife.

In cases of illness I have known this annoyance to become quite a serious matter to the invalid. Surely it ought not to be permitted.

To this might be added a minor class of nuisances, such as dogs which bark all night within a few feet of one's house; and stables attached to dwelling-houses, kept only partially clean.

VICTIM.

BADLY BUILT HOUSES AND LEGAL REFORM.

SIR,—The indignation of your correspondent at the abominable materials employed in speculative buildings, and the slight, rapid, and scamping way in which they are put together, is but too well founded; but when the vices of construction have been concealed by fine surfaces of paint and paper, it is too late to employ a surveyor, whose services can only have a full and proper scope while the works are in progress.

The fault of omission in this respect lies, however, less with builders than with a class whose avarice is tending to disturb every social arrangement; and while the surveyor is not employed on account of cost, there is generally a lawyer in the background, who absorbs three times as much money for leases and mortgage fees; the charge for purchases, for loans, and, curiously enough, for *repayments*, passing all ordinary belief. If you can work out some amendment here, it will be a benefit indeed. Perhaps houses built under the ruthless auspices of the present system would be fitly called THE DEVIL'S OWN.

"BADLY BUILT HOUSES."

WITH reference to a letter thus entitled, in a recent number of our journal (357), directing attention to what the writer calls "the infamous materials and brickwork of houses now running up not a hundred miles from Neville-terrace, Hornsey-road," the builder of the houses in Neville-terrace, and in Benjamin-road adjoining, comes to the conclusion that the remarks are intended to apply to the houses he is erecting, and requests to be enabled to deny the truth of the statement. The writer says,—

"The estate of which the houses referred to form a part was laid out under the superintendence of an eminent architect. I have a very stringent building agreement and specification (a copy of which last I inclose for your perusal), and the houses are under the constant personal supervision of Mr. Horace Field. The ground-rent of the houses (amounting to 7*s.* per foot frontage) proves that the property is not of that trumpery description your correspondent would have you believe; while the respectable class of tenants, and the fact that I have lately sold these houses to two architects (one for occupation by the purchaser), is, I think, sufficient refutation of your correspondent's assertions.

I have been in business many years, and have executed large works under different architects; and am, I think, able to form an opinion as to the quality of building materials, and can safely affirm that my houses are superior to the generality of houses of the class.

C. J. THOMPSON."

THE "INCLOSURE OFFICE."

SIR,—Allow me to supplement my former letter by a few further remarks, to make the case clearer to your readers, whom I wish to interest in it.

The inspectors of buildings attached to "The Inclosure Office" are employed to inspect works carried out by the various improvement companies, established by Act of Parliament, for the purpose of executing estate works, the cost of which is repaid by way of rent-charge: their duties are therefore far from being unimportant. They have to protect the interests of the landowner, and especially those of his successor, against the possible delinquencies of the companies or their sub-contractors. At the same time the work is of such a class that comparatively few professional men come into contact with them. Most frequently they have to meet some country builder, who does not dare to think that the man who talks much of "reporting to the *Crown*" can possibly be in error; and who, while knowing that his work is right, would, nevertheless, be utterly incapable of offering any resistance to the dictum of such an elevated and glorified authority. And even in cases where stubborn English sense refuses to yield itself up to an unjust decision, the delay and annoyance attending the process of having the decision re-examined is so great, that few have the courage or perseverance to insist upon it. Besides which, it is entirely at the commissioners' option by whom the re-examination shall be made; so that matters may only be made worse by an appeal to an ultimate authority as incapable as that appealed from.

The simple remedy for the whole evil is to appoint only properly-qualified professional men as inspectors of buildings. Surely this is not too much to ask. It would be surprising that the commissioners should ever have offered less, if one was not pretty well accustomed to the vagaries of Government officials. Let the *pay* be three, five, or any other number of guineas per day: the ground of dissatisfaction does not lie there; but first of all let us have the work done by men who are really qualified to do it.

SECTOR.

MUSIC AND THE STAGE.

Her Majesty's Theatre.—The *Cantica* written by Signor Verdi for the opening of the Palace of Art, and which the Commissioners, with very good reason, found themselves forced to decline, was executed at Her Majesty's Theatre with very great success, Madlle. Titiens singing the solos splendidly. It will be heard often enough again. The sisters Marchisio have strengthened their hold on public opinion; and Madlle. Trebelli is successful as *Rosina*. When are we to have "Oberon"?——*The Haymarket.*—A picturesque little ballet, "*La Contrabandista*," for Madame Perea Nena and her *troupe*, is the only novelty, Mr. Sothern maintaining his hold as *Lord Dundreary* in a remarkable manner. There is no mistake about the perfectness of the assumption, and the real fun in it. To make a thousand or more persons laugh wholesomely for 137 nights in succession is a good work, sanitary and social.——*The Princess's Theatre.*—Crowds have filled the house during the last week to welcome back Mr. and Mrs. Charles Kean to the scene of previous triumphs. In the "Corsican Brothers," on Wednesday night, Mr. Kean played with increased energy; determined, probably, to assert his supremacy in the part; and he certainly succeeded in doing so. "Hamlet" is to follow.

BUILDERS' BENEVOLENT INSTITUTION.

THE nineteenth election of pensioners on the funds of this institution was held on 29th May, at the London Tavern; Mr. George Plucknett, President, in the chair. The list of candidates contained the names of nine men and four women, from the former of whom two were to be elected, and from the latter, one.

At the present time there are 33 pensioners on the funds, 15 males and 18 females. The amount of the subscriptions and donations for the past twelve months has been 1,326*l.* 0*s.* 6*d.*; annual subscriptions, 841*l.* 8*s.* 6*d.*; and donations, 484*l.* 12*s.*; showing an increase in the annual subscriptions of 33*l.* 8*s.* 6*d.*, and in the donations for the same period, of 111*l.* 5*s.* 6*d.* The investment of stock in the Three per Cent. Consols is 8,332*l.* 11*s.* 4*d.*;—5,985*l.* 6*s.* 9*d.* for the relief fund, and 2,347*l.* 4*s.* 7*d.* for the building fund. By the last report there was a balance at the bankers' of 466*l.* 13*s.* 3*d.*

The Chairman, in opening the proceedings, said that, out of thirteen candidates, it was much to be regretted that the limit of their funds only allowed an election of three; particularly as the candidates were all aged, some paralyzed, and others suffering from various diseases.

The poll was then taken, and Thomas Lawrence, aged sixty-six; Robert P. Day, aged sixty-one; and Sarah Wright, aged sixty-eight, were pronounced duly elected.

The proceedings concluded with a vote of thanks to the chairman and also to the officers of the institution.

Books Received.

Where do we get it? and How is it made? A Familiar Account of the Modes of Supplying our Every-day Wants, Comforts, and Luxuries. By GEORGE DODD, author of "The Food of London," &c. With Illustrations by WILLIAM HARVEY. London: James Hogg & Sons.

THE young and inquiring are always prone to put the questions—Where does it come from? How is it made? In respect to many of those things which most interest both young and old, they will find a good deal of explanatory information in this nicely-got-up volume, in which are treated of, in a simple and understandable way, such subjects as the sources of our food and drink; the materials for clothing; our dwellings and their materials; our supply of fire and light; metals and metal manufactures; minerals and chemicals. Special attention, in the preface, is very properly pointed to the Palace of Art and Industry, as well as to the various special museums at Brompton,—such as the Food Museum, originated by Mr. Twining; the Museum of Animal Products; the Museum of Building Materials; Educational Museum, &c.; and also to the British Museum; Museum of Economic Geology; and the Botanic Museum at Kew; all of which contain objects illustrative of the information here given: and such a work as this must tend to make these popular museums still more interesting and popular than they already are. The work is illustrated by figurative engravings of a kind much above the average.

VARIORUM.

"Annual of Scientific Discovery; or Year-book of Facts in Science and Art for 1862. Edited by D. A. Wells, A.M. Boston: Gould & Lincoln." We have so often given a favourable notice of the American Year-book of Facts, that our opinion of its merits must be well known to our readers; and all we need now say is, that the volume for 1862 is as diligently compiled and as interesting and useful as ever: it contains much matter that must be new even to well-informed English readers. The present volume, we must add, contains more unacknowledged quotations from our pages than has heretofore been the case: nevertheless we do not wish to complain of anything like systematic borrowing without acknowledgment: the *Builder* has been scores of times quoted in the American Year-book of Facts in Science and Art.——"The Gas Consumer's Manual. By T. L. Marriott and George Glover. London: Kelly & Co. 1862." This little treatise contains the Sales of Gas Act of 1859, and subsequent Acts; with practical observations on the provisions of the Acts, instructions to inspectors, rules for testing meters, &c. Mr. Marriott was the solicitor and parliamentary agent employed in the preparation and passing of the Gas Act of 1859 through Parliament; and Mr. Glover was formerly lecturer on mechanical philosophy at the Royal College of Surgeons, Edinburgh. The manual is evidently

a useful one, which ought to be in the hands of managers of gas companies, meter manufacturers, local authorities, inspectors, and others.——"The Eleventh Annual Report of the Amalgamated Society of Engineers, Machinists, &c. London: printed by J. Kenny, Heathcock-court, 414, Strand. 1862." This report contains details of the expenditure of the Amalgamated Society of Engineers for 1861, together with a summary of expenditure for eleven years, and tables showing the number of deaths, causes thereof, average age at death, &c. Branch reports from all parts of the kingdom, giving details of income and expenditure, are also embodied in the report. The increase in the number of members has not been so great as last year; but nearly two thousand have been added to the society. There are now very nearly twenty-three thousand members. There are 17 more branches than there were at the time of issuing the last report; two of them in the United States. The increase of funds during the past year has amounted to 13,194*l*. The present balance is the largest shown; the total amount being 73,398*l*. 1s. 0½d., or 3*l*. 4s. 2d. per member. The expenditure for 1861 was 42,939*l*., or at the rate of 1*l*. 17s. 6¾d. per member. The number of deaths was 209 men and 116 women; the former at the average age of 36¾, and the latter of 33¼. The cause of death is stated to be mainly consumption. The amount expended in support of the four principal benefits, viz., donation, sick, funeral, and superannuation, was 35,727*l*., or equal to 1*l*. 11s. 3d. per member.

Miscellanea.

THE LOCKE MONUMENT.—Sir,—This, it will no doubt have been observed, is a simple reproduction of the cross in Selby Market-place. Should it not have been so stated in justice to the original designer?—J. G. E.

ROYAL BERKSHIRE HOSPITAL.—The contractors, Messrs. Sharpington and Cole, of London, have completed their contract for the erection of the new wings to this institution; and, according to the *Reading Mercury*, the work has been performed in a manner which has given satisfaction to Mr. Morris, the architect, and the Board of Management. The new works were handed over on the day on which the date of the contract expired. The upper floors have been varnished, so as to do away with the damp arising from the washing of boards.

"PAGAN ART."—The gentleman who presided at the lecture on this subject reported in our last considers his expressions not correctly set forth, (though the Reporter is quite clear on the matter), and says they were in effect as follows:—

"Greek art was, in certain respects, the finest and purest in the world; as, for instance, in the exquisite refinement of its execution, in which it surpassed Mediæval art, because the fervour with which the latter pressed always onward towards its far higher and more spiritual aims left not time to elaborate detail in the same manner. That Greek art was, however, utterly unsuited to modern requirement; that all our attempts to revive it had been complete failures, and it was to be hoped would not be renewed; yet still we might obtain from its glorious remains much that would help us to improve our own art."

KITCHEN BOILER EXPLOSIONS.—The frequency of these explosions in the north of England is a remarkable fact to which we have before now pointed attention. Whether it be from the more frequent use of such boilers in that part of the country, or from some peculiarity in their construction, or in the mode of using them, we do not yet know; but certainly they are often enough used in London, and elsewhere in the south of England, without one hearing so often of serious accidents arising from their use. The occurrence of a dreadful tragedy in Manchester, originating, as alleged, in one of these explosions, induces us again to point attention to the circumstance adverted to. A child had been killed by the explosion of a kitchen boiler at Manchester; and the parents, who had in vain tried beforehand to have the boiler made safe, urged the house-agent, who had been censured by the coroner's jury, to pay them 50*l*. damages. This the agent refused to do; and afterwards he had occasion to distrain on them for rent in arrear, which he is said to have done with rather irritating and unnecessary harshness and severity. The circumstances altogether seem to have preyed upon the ill-regulated minds of the parents of the child who had been killed; and they deliberately murdered, first their own three remaining children, and next the house-agent, whose sons also made a narrow escape from a similar fate; and all through the *fault* of a boiler!

THE DRAINAGE AND PAVING OF ODESSA.—Mr. George Furness, the contractor for the great outfall works at Plaistow in connection with the Metropolitan Railway, has contracted to pave and drain Odessa. The cost is estimated at 800,000*l*. The contract was negotiated by Mr. Bayliss, C.E.

ROYAL SCOTTISH ACADEMY.—The exhibition which has lately closed has been on the whole successful. The day season-ticket holders were nearly 4,000. For the evening exhibition considerably above 1,000 season-tickets were issued. During the day more than 18,000 visitors paid for checks, and in the evening about 19,500. Catalogues sold—during the day, 7,913; and in the evening, 2,626; total, 10,539. The sales this year exceed those of last year by nearly 2,000*l*.

THE AGRICULTURAL HALL, ISLINGTON.—At a special general meeting of the shareholders, as to increasing the capital of the company, the secretary read the report of the directors, which stated that the hall is approaching completion. The company have obtained an additional frontage (making in all 45 feet) in the Upper-street. It was part of the understanding with the Islington vestry that a more imposing entrance than that originally designed should be built in Upper-street; and to this purpose a portion of the money designed for the second-class refreshment-rooms will be devoted. The works ordered by the district surveyor; unforeseen difficulties in the foundation and sewers; and other indispensable additions to the original contract, amount altogether to about 3,000*l*. To this must be added the cost of warming, gas, lighting, ventilating, water supply, furniture, and fittings, estimated at between 3,000*l*. and 4,000*l*. Additional capital to the extent of 9,000*l*. was authorized by the meeting, to be raised by the issue of shares.

THE MIDLAND INSTITUTE COMPETITION.—The following, from the *Birmingham Journal*, shows what is thought of the doings of the town council in their own neighbourhood:—"It may be recollected that, in commenting upon the determination of the town council to engage another architect to complete the building of the Institute for a free library, we expressed a doubt if many architects of eminence would enter into the competition to erect a work which another person had designed. This apprehension is justified by the result, so far as concerns the chief members of the profession in Birmingham. At a special meeting of the Architectural Society, held on Wednesday last, it was resolved, 'That this meeting, considering that the dispute between the corporation and Mr. Barry is still pending, is of opinion that it is inexpedient that members of this society should enter into competition for the proposed extension of the Midland Institute.' How far the same considerations of policy may influence strangers, or Birmingham architects who are not members of the society, we have no means of knowing; but we believe we are not wrong in assuming that the chief architects in London and the provinces will imitate the example of their brethren in this town."

THE RESTORATION OF MINSTER CHURCH, ISLE OF THANET.—At the Minster Easter vestry, Mr. W. Rogers, of Sheriff's Court, who has taken the lead in this long-wished-for improvement, produced some plans and drawings which had been prepared for the work. The first was a drawing of the Norman arch in the west end of the tower, restored. This arch, the only one of the same character in the building, has for many years been hidden by a lodge-like projection, many of the parishioners not even knowing of its existence. The principal and only entrance into the edifice is to be through this arch. The east arch of the tower is Saxon. The bases of the pillars are to be restored and hewn; the flooring to be raised five inches, and paved with the best Minton tiles. Amongst other improvements, the organ will be placed near the south transept window, and every fitting of woodwork to be taken down, and none replaced, except carved stalls in the chancel. The cost of the whole will amount to nearly 1,600*l*. All the propositions relating to the church were carried unanimously: the plans and drawings of Mr. W. E. Smith, "architect and builder," of Ramsgate, and the report of Mr. Ashpitel, being generally approved. The works are to be carried out by Mr. Smith, and occasionally superintended by Mr. Ashpitel. The vicar and wardens constitute the building committee. Various other restorations require to be done. The groining of the transepts will entail a cost of 500*l*., besides the estimates and plans produced at the late meeting. On the whole work of restoration, repewing, paving, and groining, a sum of nearly 400*l*. more is wanted.

NONCONFORMITY MEMORIALS.—Above 84,000*l*. have been subscribed to a fund for building the memorial-hall in the metropolis, already alluded to, and erecting new chapels in the provinces, in celebration of the Bicentenary of Nonconformity. Some promoters of the movement are sanguine that even this sum will be doubled during the current year.

EMBANKMENT OF SOUTH SIDE OF THAMES.—In the Commons last week Mr. Doulton asked the First Commissioner of Works whether there was any probability of the commission on the embankment of the south side of the Thames making their report before the prorogation of Parliament; and Mr. Cowper replied that he believed the commission would be prepared to make a report before the conclusion of this session.

INSTITUTION OF CIVIL ENGINEERS, DUBLIN.—At a recent general meeting of this institution, in the Museum Buildings, Trinity College, Mr. C. Hodgson read a communication "On the Manufacture of the Compressed Peat for Fuel in Ireland." He spoke in the beginning of his paper of the extreme importance of utilising the peat bogs of Ireland, which extended over three millions of acres. After some remarks from the president and other gentlemen, Mr. Anderson, of the firm of Courtney, Stephens, & Co., said that the value of this fuel, compared with coal, was as 75 to 100; but as it could be produced at 9s., whereas coal cost 20s., per ton, the advantages of the manufacture would be easily apparent. After some discussion, the meeting adjourned.

A STEAM TRAVELLING CRANE.—Messrs. Ellis, of Salford, have completed a steam travelling crane for the new battery works of the Government at Portsmouth. The crane (their own invention) is capable of lifting 20 tons with a pressure of 40 lbs. It is worked by two small cylinders, with a perpendicular tubular boiler, and has three motions—longitudinal, horizontal, and perpendicular,—with a span of 54 feet. The engineer, who stands in front of the crane, has all its motion under his command, and can double its power with facility. A water tank and pump for supplying the boiler are also connected.

THE BRITISH MUSEUM BILL.—The Chancellor of the Exchequer moved the second reading of this Bill in the Commons last week, when some discussion took place, in which the objects of the Bill were explained and supported by the mover and by Lord Palmerston, who said it was essentially a Bill to provide, for 10,000*l*., what must otherwise cost 50,000*l*.; namely, a site for buildings which must be erected. Sir G. C. Lewis, Mr. Walpole, and others, also supported the Bill; and it was opposed by Mr. Gregory and other speakers; and finally defeated by a majority of 163 to 71 against the Government.

IMPROVEMENTS AT THE SUNDERLAND DOCKS. Mr. Abernethy, C.E., has reported to the Wear Commission as to what he considers requisite to be done in order to ensure the present safety of the docks, and to provide for future extension, avoiding all interruption to the existing traffic of the docks. The cost of the works recommended he estimates as follows:—First pier or breakwater, 25,000*l*.; second cofferdam, jetty, and formation of entrance channel, 21,000*l*.; third entrance lock, 45,000*l*.; fourth dock, formation of quays, and protection of slopes, 94,000*l*.; fifth entrance between docks, bridge, and gates, 15,000*l*.; making, with 10,000*l*. for contingencies, a total of 210,000*l*. The commissioners resolved unanimously to execute the break-water at once; but the execution of the other works has been postponed for future consideration.

COURT OF COMMON COUNCIL.—Several of the proceedings of this court, at the Guildhall, London, last week, require notice. The court accepted the reversion of the splendid album exhibited at present in the Austrian court of the Palace of Art: it is 6 feet wide; 3½ feet high; and weighs 708 lb.: the paper is considered to be very fine, and the binding is both costly and elegant. The freedom of the City in a gold box was next voted to Mr. Peabody for his munificent gift of 150,000*l*. for behoof of the poor of London. Afterwards Mr. Hartridge moved that this court do assent to the proposal of the London, Chatham, and Dover Railway to erect a bridge of five arches or spans across the river Thames near Blackfriars Bridge. There was also a report upon the same subject by the Bridge-house Estates Committee; and both subjects were taken into consideration together, and led to a long and rather warm discussion, as to the number of arches, the embankment, &c.; after which the resolution of Mr. Hartridge was negatived by a majority of 44; the numbers being,—For the reception of the report, 61; for Mr. Hartridge's resolution, 17.

NEW BRIDGE FOR DROGHEDA.—The *Drogheda Argus* states, that the presentment for a new bridge will come before the grand jury at the June assizes. The bridge, as proposed, will be of cast iron, about 45 feet wide, with raised footpaths on each side; parapet about 4½ feet high; one span across the river, resting on solid masonwork: the river will be thus freed from all obstruction, and advantages gained to the scouring power of the Boyne.

A CRYSTAL PALACE AND WINTER GARDEN FOR DUBLIN.—A company has been formed, of which the directors are forty of the most influential and active noblemen and gentlemen in the city of Dublin, with the Duke of Leinster as chairman, and Mr. Benjamin Lee Guinness as vice-chairman. Mr. Guinness, a short time ago, purchased the fields called the Coburg Gardens, at the south side of Stephen's Green, containing about 15 acres. This ground is to be converted into a winter garden, in the centre of which the palace is to be erected at a cost of 50,000*l*. The building is to contain a large concert-hall, also galleries of art and industry, &c.

DRINKING-FOUNTAIN MOVEMENT.—At Hay, according to the *Hereford Times*, the Rev. Mr. Bevan has announced his intention to present the town with two drinking-fountains, on condition that the same be erected in such places as he may select.——A public fountain is in course of erection at the foot of Elvet Bridge, Durham. The structure owes its erection to Mr. John Gowland, a member of the corporation, at whose sole expense it is being put up. It is the first erection of the kind in Durham.——At Broseley it has been determined that a prize of 20*l*. should be awarded for the best design for a memorial fountain. Several architects, accordingly, sent in plans. Mr. Griffiths's plan found six supporters among the committee, and Mr. W. Thursfield's four: Mr. Griffiths's, therefore, was adopted by a majority of two.

THE POLYTECHNIC.—As there are some Japanese in London, of course our energetic friend Mr. Pepper gives to the public a panorama of Japan. The views, which embrace the principal street, fish-market, and bridge of Yeddo, temples, teahouses, theatres, private residences, the foreign consulates, the residences of the British and American ministers, and the house which Lord Elgin occupied during his stay in the island, extend over 9,000 feet of canvas; and, presuming, as we are assured, that they are faithful delineations of what they profess to represent, enable us to form a pretty accurate notion of the country. In architecture, the Japanese have during the 2,000 or 3,000 years of their social organization scarcely improved upon the most primitive form of roofed hut. The houses have in no case more than one story: even the temples and public buildings do not seem to have reached a higher elevation than some 20 or 30 feet; and the bridges and defences are of the rudest construction.

COSTLY WORKS AT ALDERNEY.—The Government have been very nearly defeated in the House of Commons on the subject of Alderney, one of the Channel islands. In Committee of Supply upon the Harbours of Refuge Vote and Civil Service Estimates, on the first vote, of 150,000*l*., for constructing certain harbours of refuge, Mr. Baxter moved its reduction by 90,000*l*., being the sum asked for Alderney. In 1848 the plan was to cost 620,000*l*.: in 1854 the cost was enlarged to 1,300,000*l*.: in 1857 it had risen to 1,850,000*l*.; and in 1859 it culminated to a grand scheme which would involve an expenditure of 2,000,000*l*. It was entirely a misnomer, he said, to call Alderney a harbour of refuge. In point of fact no vessels took refuge there, excepting French revenue cruisers. He was informed that successive governments had been in possession of a report from the engineer officers to the effect that the best thing that could be done, in the event of a war with France, would be to blow up the works altogether. After some discussion the vote was passed by a majority of 138 to 130.

TENDERS.

For restoration of Grey Friars' Church, Reading. Messrs. Poulton & Woodman, architects:—

Carpenter's and Smith's Work to Roof.

J. & R. Lawrance	£1,190	0	0
Perry	1,098	0	0
H. Cooper	1,094	0	0
Sawyer	1,090	0	0
Matthews	999	0	0
Woodroffe	995	4	0
Strong (exclusive of Smith)	909	0	0
Sheppard (accepted)	899	0	0

For Stonework.

Wheeler (accepted)	£1,890	0	0

For a pair of semi-detached model cottages, at Lyston Court, Herefordshire, for Mr. R. M. Lingwood. Messrs. Elmslie, Franey, & Haddon, architects:—

Pearson & Son	£300	0	0
Watkins (accepted)	270	0	0

For alterations and additions to the White Hart Hotel, Uttoxeter. Mr. R. Scrivener, architect:—

Sheppard	£562	0	9
Mathews	560	0	0

For a detached villa, on Mockbeggars Estate, Reading, for Mrs. M. Jones. Messrs. Cooper & Goulding, architects. Quantities supplied:—

Woodrolfe	£738	0	0
Watson	754	0	0
Barnicoat	702	10	0
Norris	692	0	0

For a detached house, with stabling, at Whiteknights, Reading, for Mr. W. J. Barten. Messrs. Cooper & Goulding, architects. Quantities supplied:—

Whiting	£1,175	17	6
Woodrolfe	1,082	0	0
Norris	1,049	0	0
Barnicoat	1,034	0	0

For a dwelling-house, in South-street, Reading, for the Wesleyan Committee. Messrs. Cooper & Goulding, architects. Quantities supplied:—

Whiting	£798	0	0
Barnicoat	785	0	0
Watson	775	0	0
Norris	670	0	0

For alterations and additions to British School, Reading, for the Committee. Messrs. Cooper & Goulding, architects. Quantities supplied:—

Norris	£571	0	0
Dunn	511	0	0
Watson	484	0	0

For additions, &c., to the Isle of Thanet Union, Minster, Kent. Mr. Francis Edwards, architect. Quantities supplied:—

Kirk	£4,493	0	0
Newby	4,468	0	0
Smith & Son	4,374	0	0
Chinnock Brothers	4,000	0	0
Sawyer	3,992	0	0
Stiff & Richardson (accepted)	3,747	0	0

For erecting a mansion without the offices, lodges, &c., for Mr. R. F. Wingrove, J.P. Messrs. Guillaume, Parmenter, & Guillaume, architects:—

Scott	£5,267	0	0
Phillips	5,175	0	0
Futcher	4,935	0	0
Stevens	4,897	0	0
Gambling	4,650	0	0
Bull (accepted)	3,983	0	0
Adams	3,785	0	0

For building a shop and residence in the Above Bar-street, Southampton, for Mr. Andrews, T.C. Messrs. Guillaume, Parmenter, & Guillaume, architects:—

Blackman	£1,562	0	0
Phillips	1,222	0	0
Adams	1,192	0	0
Bailey	1,050	0	0
Bull (accepted)	1,046	0	0
Martin	1,000	0	0
Evans	600	0	0

For erecting two houses, on the Marsh Estate, for Mr. G. Dowman. Messrs. Guillaume, Parmenter, and Guillaume, architects, &c.:—

Jessop	£922	0	0
Stevens	850	0	0
Grimes	839	0	0
Philps	765	0	0
Bull	700	0	0
Scott (accepted)	550	0	0

For alterations at the "Grange," Shirley, for Mr. Hewer. Messrs. Guillaume, Parmenter, & Guillaume, architects:—

Scott (accepted)	£445	0	0

For making "Havelock Road":—

Croft	£104	10	0
Hewett & Beeman	102	0	0
Barnes	97	10	0
Cox (accepted)	95	0	0

For additions and repairs to a public-house at Tongham, near Aldershott, for Mr. William Cave. Messrs. Eggar & Stapley, architects:—

Birch	£400	0	0

For building a public-house, stabling, and coach-houses, at Aldershott, for Mr. Henry Hall. Messrs. Eggar & Stapley, architects:—

Birch	£1,100	0	0

Accepted tenders for restoring the chancel of Ponteland Church, for Merton College. Mr. F. R. Wilson, architect:—

For Mason's Work.

	If internal walls are chiselled.			If plastered.		
Armstrong	£123	0	0	£94	0	0

For Carpenter's Work.

	For roof, &c.			For oak stalls.		
Healey	£97	0	0	£47	0	0
Forster				44	10	0

For Slater's Work.

Armstrong	£23	1	0

For Plasterer's Work.

Armstrong	£15	6	0

For the erection of new Sunday school-rooms and classrooms, Haward Chapel, Bedford. Mr. Usher, architect:—

Haynes	£574	0	0
Reynolds & Son	532	0	0
Corby	520	0	0
Norman	490	0	0
Hull	475	4	0
Houghton	462	10	0
Francis & Son (accepted)	442	4	0

For alterations to Rose and Crown Inn, Greenwich Mr. Smith Williams, architect:—

Piper & Wheeler	£2,865	0	0
Sewell	2,810	0	0
Macey	2,798	0	0
Robinson	2,740	0	0
Hill, Keddel, & Co.	2,670	0	0
Maeers	2,529	0	0
Walker	2,461	0	0
Searle	2,197	0	0

For building houses, King-street, Covent-garden. Mr. John Whichcord, architect:—

Tarrant	£2,925	0	0
Axford & Co.	2,905	0	0
Macey	2,895	0	0
Colls & Co.	2,854	0	0
Thompson	2,728	0	0
Jackson & Shaw	2,677	0	0
Turner & Sons	2,538	0	0

For alterations and additions to the Hereford County Gaol. Mr. Wm. Chick, county surveyor, architect:—

Pearson & Son	£2,070	0	0
Welsh	1,562	0	0
Bigglestone	1,525	0	0
Ruddle & Thompson (accepted)	1,495	0	0

For the erection of a warehouse, vaults, and offices adjoining, in Cooper's-row, Crutched Friars, E.C., for Mr. Duncan Irvine. Mr. R. Norman Shaw, architect. Quantities supplied by Mr. T. W. Goodman:—

Little	£7,389	0	0
Wells	6,860	0	0
Patman & Fotheringham	6,649	0	0
Coleman	6,549	0	0
Saunders	6,490	0	0
Browne & Robinson	6,488	0	0
I'Anson	6,340	0	0
Myers & Sons (accepted)	6,298	0	0

TO CORRESPONDENTS.

S. & C.—Pottery Co.—R. W.—A Young Builder (matter of private arrangement in each case. If money were left "*as a deposit*," it should be returned).—A. W. B.—J. B. G.—W. H. V. S. (thanks. Copies have been sent).—G. B.—B. S. C.—G. M.—L. R.—G. C.—Mr. M.—T. E. B.—W. S.—A Subscriber.—Enquiry (time would fail if we under took to answer such inquiries).—D. H.—E. W. S. (ask the builder to send us some particulars. We shall publish a view).

Portland Cement and Water.—"Will some of your chemical correspondents kindly inform me if there is anything injurious to the water in the common Roman or Portland cement with which rain-water tanks are often cased; and, if there be, can they also inform me if there is any substitute equally cheap and more suitable?—W."

NOTE.—*The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.*

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Advertisements cannot be received for the current week's issue later than **FIVE o'clock, p.m.,** *on Thursday.*

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King's Lynn, May 27, 1862. HENRY EDWARDS, Secretary.

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TO ENGINEERS and GAS-FITTERS.—The trustees of Mrs. ANN NEWTON'S CHARITY for placing out Boys belonging to the parish of St. James's, Westminster, will meet at the Workhouse, in Poland-street, Oxford-street, on FRIDAY, the 6th day of JUNE next, at SIX o'clock in the Evening precisely, to receive APPLICATIONS for TWO APPRENTICES, one as an Engineer, the other as a Gas-Fitter, for which the youths have expressed a preference.—Any further information required may be obtained daily between Ten and Four o'clock, at the Parochial Office, Poland-street, Oxford-street, where the boys may be seen. Every applicant must attend the Board meeting in person, and bring a card containing his name, address, and business, with two references as to character, &c. None but householders need apply.—By order of the Trustees, GEORGE BUZZARD, Clerk.